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Table of Contents.

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ORIGINAL ARTICLES— Page.
The Distribution and Availability of Nutrient Production in New South Wales, by H. S. Halcro Wardlaw, D.Sc., F.A.C.I., E. G. Hallsworth, Ph.D., B.Sc., S. C. Graham, B.Sc.Agr., and W. H. Pawley, B.A. .. 225

REPORTS OF CASES—
Gangrene of the Leg following High Ligation of the Great Saphenous Vein, by J. S. T. T. Hill 238

REVIEWS—
An Index of Treatment .. 239
Mental Deficiency .. 239
Clinical Ophthalmology .. 240
Radiographic Positions .. 240

BOOKS RECEIVED .. 240

LEADING ARTICLES—
War-Time Medical Research in England .. 241

CURRENT COMMENT—
Aortic and Pulmonary Valvulotomy .. 242
The Local Application of Sex Hormones .. 243

ABSTRACTS FROM MEDICAL LITERATURE—
Gynæcology .. 244
Obstetrics .. 245

BRITISH MEDICAL ASSOCIATION NEWS— Page.
Scientific .. 246
New South Wales Branch News .. 249

MEDICAL SOCIETIES—
The Medical Sciences Club of South Australia .. 250

THE ROYAL COLLEGE OF OBSTETRICIANS AND GYNÆCOLOGISTS .. 251

CORRESPONDENCE—
Medical Fees and Nationalization of Medicine .. 251
Pulmonary Tuberculosis in South Australia .. 251

AUSTRALIAN MEDICAL BOARD PROCEEDINGS—
New South Wales .. 251
Queensland .. 252
Tasmania .. 252

OBITUARY—
William Francis Orr .. 252
Thomas Alexander McLean .. 252

MEDICAL APPOINTMENTS .. 252

DIARY FOR THE MONTH .. 252

MEDICAL APPOINTMENTS: IMPORTANT NOTICE .. 252

EDITORIAL NOTICES .. 252

THE DISTRIBUTION AND AVAILABILITY OF NUTRIENT PRODUCTION IN NEW SOUTH WALES.

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THE relation between the nutritive requirements of the population of New South Wales and the local production of essential nutrients has been investigated in the present survey. The investigation was commenced during the war years, at a time when there seemed to be a possibility of some disruption of communications with a resulting isolation of some areas of the State. The subdivisions considered were those defined by the Emergency Supply Authority with reference to available transport systems and local centres of distribution.

The many points of interest which came to light in the preliminary work have led to the extension of the investigation to the form in which its results are now presented. Although the information which has been obtained is far from complete, it gives a picture of the food supply of the population of New South Wales, in terms of its nutrient content, from a point of view from which it has not previously been considered in detail. In particular it gives information as to the quantities of essential nutrients available from local products in various portions of the State.

AREAS OF SURVEY.

The State of New South Wales (including Australian Capital Territory) has been subdivided into twenty-nine districts, for the purpose of this survey. The towns named serve as distributing centres for the districts: The approximate populations and areas, and the percentages of the total population and area in each district are shown in Table I.

TABLE I.

Approximate Populations (in Thousands of Persons) and Areas (in Thousands of Square Miles) of Districts Considered.

District.	Population.	Percentage of Total.	Area.	Percentage of Total.
1. Lismore ..	90·7	3·29	3·25	1·05
2. Grafton ..	38·4	1·39	4·63	1·49
3. Kempsey ..	28·9	1·05	2·27	0·73
4. Taree	38·4	1·39	3·76	1·21
5. Newcastle ..	266·8	9·67	5·97	1·92
6. Sydney ..	1477·9	55·55	2·44	0·79
7. Wollongong ..	57·7	2·09	0·42	0·14
8. Nowra ..	19·7	0·72	3·44	1·11
9. Bega	17·8	0·65	3·81	1·23
10. Tenterfield ..	20·1	0·73	4·44	1·43
11. Armidale ..	28·4	1·03	6·69	2·15
12. Muswellbrook ..	22·2	0·80	4·65	1·50
13. Lithgow ..	41·7	1·51	2·71	0·87
14. Moss Vale ..	26·1	0·95	2·02	0·65
15. Goulburn ..	50·0	2·17	12·44	4·00
16. Inverell ..	18·7	0·68	4·19	1·35
17. Tamworth ..	48·0	1·74	6·94	2·24
18. Mudgee ..	22·2	0·81	4·16	1·34
19. Orange	69·9	2·53	5·16	1·66
20. Moree	16·4	0·60	8·85	2·85
21. Narrabri ..	16·8	0·61	8·82	2·84
22. Dubbo ..	60·7	2·20	21·66	7·00
23. Forbes ..	43·2	1·57	10·72	3·45
24. Cootamundra ..	63·0	2·28	9·63	3·10
25. Wagga ..	48·3	1·75	7·03	2·26
26. Albury ..	32·0	1·16	3·00	0·97
27. Leeton ..	47·9	1·73	13·69	4·41
28. Deniliquin ..	14·1	0·51	7·28	2·35
29. Western Division	54·9	1·99	125·50	40·43
Industrial areas ..	1814·0	65·72	11·53	3·72
Rural areas ..	890·9	32·28	173·34	55·84
Total	2759·8	—	310·37	—

The districts tend to be larger and more sparsely populated as their distance from the coast increases.

In the vicinity of the two main cities they are small and densely populated. The figures for population are those for the immediately pre-war years 1939-1940. It is realized that considerable movements of population and redistribution of sex and age groups occurred during the war years.

The situation of the various districts is shown in the maps in Figures I to X.

The areas fall into three groups, as follows. (i) The contiguous areas 5, 6, 7 and 13, which include the towns of Newcastle, Sydney, Wollongong and Lithgow. In these areas the populations are engaged mainly in secondary industries. In them are the main coal deposits at present being worked in New South Wales. They may be called the industrial areas. (ii) The 24 areas in which the population is engaged mainly in primary industries.

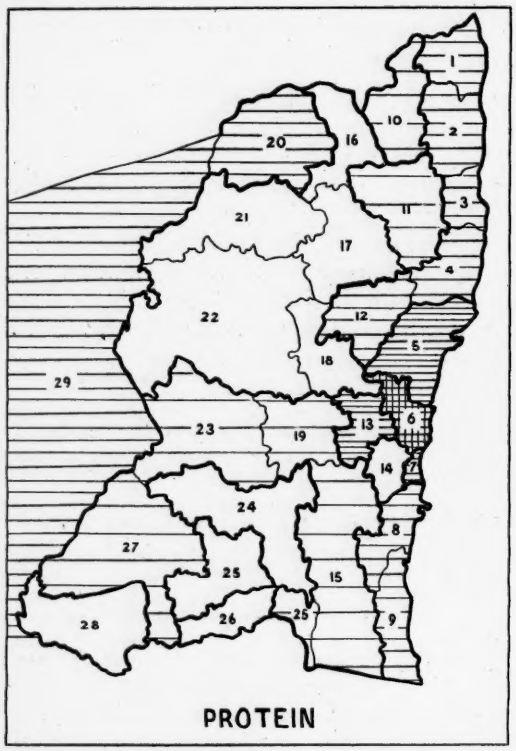

FIGURE I.

They may be called the rural areas. (iii) The Western Division. This differs from the other areas in several ways. Its size is very large compared with the other areas. Owing to its large size and poor system of communications, it contains no town which can be used as a distributing centre. Its population is not only sparse on the average, but is also unevenly distributed. Less than half of its population is engaged in primary production.

The approximate areas and populations of these divisions are as follows. (i) The industrial area is 11,530 square miles or 3·72% of the State. Its population is 1,814,000 or 65·7% of that of the whole State. (ii) The rural area covers 173,340 square miles, or 55·84% of the whole State. Its population is 890,900 or 32·3% of the total. (iii) The area of the Western Division is 125,500 square miles or 40·4% of the State. Its population is 54,900 or 1·99% of the total. More than half its population (28,300) is concentrated the the town of Broken Hill, which is an important industrial centre. It has not, however, been considered with the other industrial areas.

The density of population varies over a wide range in the three groups of areas considered. In the industrial area it is 157·0 persons per square mile; in the rural area, 5·17 persons; in the Western Division, 0·44 person. Within the last area the density of population outside Broken Hill is only 0·21 person per square mile. The density of population in the industrial area is 30·3 times that in the rural area, 336 times that in the Western Division, and 733 times that of the portion of this area outside Broken Hill. Most of the production of the nutrients occurs, as might be expected, in the rural areas. There are, however, great disparities in the density of production or productivity of the industrial and rural areas and the Western Division. The productivity will be considered from the point of view of these areas and of their populations.

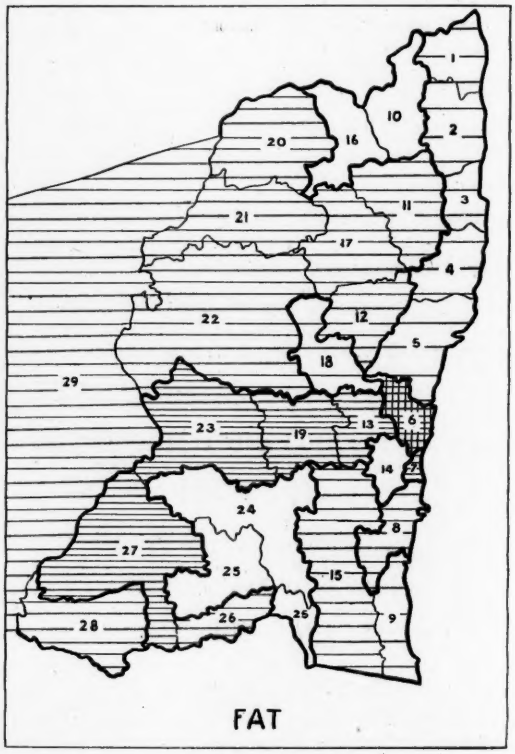

FIGURE II.

NUTRITIVE REQUIREMENTS OF POPULATION.

The simple practice of expressing the nutritive requirements of a population in terms of adult male units proved satisfactory while attention was focused mainly on energy requirements. However, the differing requirements of protective food constituents of different age and sex groups of the population must, in the light of our increasing knowledge, be given special consideration. The weighted mean requirements of the population must be calculated from the different groups which need separate consideration. These calculations have been made for the age and sex groups shown in the New South Wales Statistical Register for 1935-1936 (the latest in which the detailed figures are available). It has been assumed that this distribution is not materially different for the period for which the investigation has been made. The figures for this distribution are given in Table II.

The number of women in the later half of pregnancy has been assessed as half the number of births, including still-births. The number of lactating women has been assessed at half the number of children aged under one

year, although this figure will be in excess of the number of women actually suckling their infants.

Information with regard to the requirements of protective food constituents is still far from satisfactory. With respect to these requirements, the population may be divided into two main groups: (i) those known to be especially vulnerable to deficiencies; (ii) those who do not appear to be so vulnerable. The first group, as will be seen from Table II, includes all those individuals involved in processes of growth, including reproduction—that is, immature individuals and pregnant and lactating women. This group is subdivided according to sex and age. The second group includes adults not directly concerned with processes of growth. It is subdivided according to sex.

The food requirements of the population have been assessed on this basis from the "Recommended Dietary Allowances" (RDA) published by the Food and Nutrition Board of the United States National Research Council (1944), with certain modifications. In putting forward the figures which they recommend for protective constituents, the Food and Nutrition Board had in mind "a tentative goal toward which to aim in planning practical dietaries". A margin of 50% was allowed over what seemed, on the basis of a consideration of published figures, to be the minimal requirements of adults. In the present state of knowledge this represents rather a high level in the nutrition of adults in the non-vulnerable groups. This margin has therefore been discarded in this study. The figures taken for adults in these groups was obtained by multiplying the Nutrition Board's figures by the factor 0·7. This modification was used, with the approval of the Board, in the reports of the Joint Committees on Dietary Levels in the United Kingdom, Canada, and United States (1944) and in the United Kingdom and Australia (1945).

TABLE II.

Percentage Distribution with Respect to Sex and Age of Population of New South Wales.

Subjects.	Vulnerable Group (41·02%).	Non-Vulnerable Group (58·98%).
Children:		
0 year	1·63%	
1 to 3 years	5·31%	
4 to 6 years	5·72%	—
7 to 9 years	5·86%	
10 to 12 years	5·94%	
Boys:		
13 to 15 years	2·81%	—
16 to 20 years	4·71%	
Girls:		
13 to 15 years	2·73%	—
16 to 20 years	4·65%	
Women:		
Pregnant	0·86%	—
Lactating	0·82%	
Men, moderately active	—	30·75%
Women, moderately active	—	28·23%

For the vulnerable groups even less is known about safe minimal requirements. In view of the more serious effects of deficiencies on these groups, a considerable margin of safety should be retained until fuller knowledge shows it to be excessive. The recommended allowances of the Food and Nutrition Board for these groups have therefore been taken without modification.

In calculating the weighted means from the modified RDA figures and Table II, Calorie and thiamine values for moderately active adults have been used. In calculating the values for children aged under one year, an average body weight of seven kilograms has been assumed. In calculating the protein requirements of this group an average daily value of 25 grammes has been taken. The weighted daily mean requirements for Calories, protein, calcium, iron, vitamin *A*, thiamine and ascorbic acid have been calculated from this table with the modifications mentioned above. The RDA figures for energy and protein requirement have been used without modification. These figures probably exaggerate somewhat the energy requirements of adolescent males.

Certain values, not considered by the above-mentioned authorities, have also been calculated. The first are those of fat and carbohydrate, daily allowances of 100 grammes and 450 grammes respectively for an adult male of moderate activity being assumed. It is realized that the proportion between these figures is arbitrary. Considerable variation is permissible and normal in the relative quantities of fat and carbohydrate, provided that energy requirements are met. It was desired, however, to have some basis of comparison of the production and

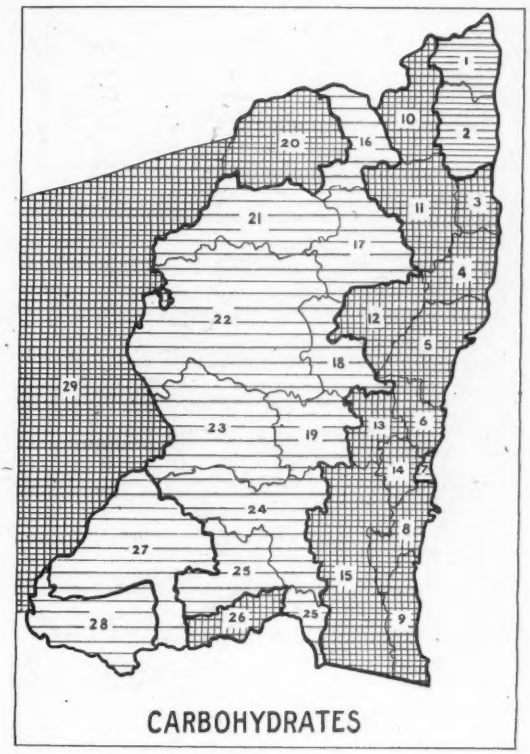

FIGURE III.

requirements of these constituents of the diet. The weighted means of the requirements of these constituents have been calculated on the assumption that their distribution for the different age and sex groups is the same as that of the energy requirements.

Secondly, as there is evidence that a considerable proportion of Australian households subsist on diets containing amounts of calcium below the RDA (Clements *et alii*, 1945), it seemed desirable to include information about supplies of phosphorus. The figure of 1:1·3 for the calcium-phosphorus ratio has been used to calculate a phosphorus requirement. This ratio is rather higher than that selected by Sherman (1937) and accepted by McCollum *et alii* (1939). Their figure seems to have been somewhat arbitrarily chosen. It is based on the ratio of these elements in human milk, and on the fact that calcification is poor in young animals in whose diets the ratio is unduly high. It refers more to the requirements of the infant than to those of the population as a whole.

The RDA of the population as a whole, expressed as the weighted means of the different groups, and with the additions mentioned, are shown in Table III.

ANNUAL PRODUCTION OF FOODSTUFFS.

The figures for the annual production of the various foodstuffs in the different areas have been derived from the records of the New South Wales Department of Agriculture and Bureau of Statistics through the courtesy of the officers in charge of the appropriate divisions. The quantities of foodstuffs available to the local populations were arrived at as follows.

Many districts produce foodstuffs in excess of their requirement. The excess is exported to other parts of the State, to other States, or overseas. Only the fraction not exported is normally consumed by the local population. These quantities are not known for individual districts, but the average consumption per head for the Commonwealth is known. In the assessment of the quantities available from local production, it has been assumed that

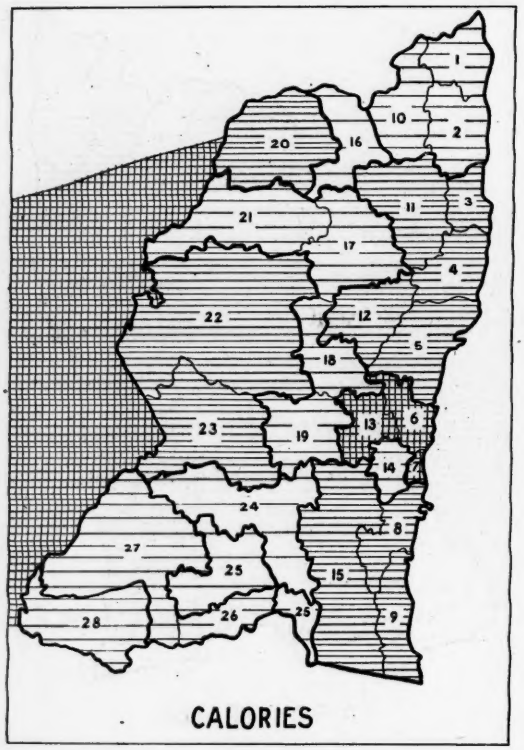

FIGURE IV.

where the total local production does not exceed the average consumption the foodstuff is all consumed locally —that is, it is all "available" to the local population. Where an excess is produced the local consumption has been assessed as the average consumption for the Commonwealth. This treatment will tend to under-estimate the quantities available to the populations of districts which are large scale producers of the foodstuffs in question.

Only foodstuffs produced in an edible form entirely from locally produced materials are regarded as locally available. For example, wheat which is not milled in the area in which it is grown is not regarded as available as a foodstuff for human consumption. This means that the great bulk of wheat produced is not locally available. Again, milk produced by cows fed on imported fodder is not accounted as an available local product. This includes the greater portion of the considerable quantities of milk produced in the metropolitan area.

The figures given for milk production are for milk as such. They have been derived by deducting from the total production the quantities used for the production of butter (assuming a yield of 0·3 pound of butter per gallon) and cheese (assuming a yield of one pound per gallon).

The production of meat was calculated from the stock population of each area and from the average percentage slaughtered over a period of ten years. It is hoped that in this way aberrant figures for the proportions of stock slaughtered in exceptional seasons and in different areas have not been given undue weight. The actual numbers of beasts slaughtered in each area in the year of the examination have not been used, partly for the reasons given, and partly because many beasts are not slaughtered

TABLE III.

Weighted Means of Recommended Daily Allowance per Person.

Nutrient.	Amount.	Nutrient.	Amount.
Calories	2,564	Iron	9·67 milligrammes
Carbohydrate ..	386·0 grammes	Vitamin *A* ..	3,720 international units
Fat	82·7 grammes	Thiamine	1,165 microgrammes
Protein	66·9 grammes	Ascorbic acid ..	58·4 milligrammes
Calcium	800·0 milligrammes		
Phosphorus ..	1,070 milligrammes		

in the areas in which they are raised. Animals raised in any district are regarded as foodstuffs available in the district although they may not usually be slaughtered in it. This treatment of the data for meat differs from that for wheat. It is thought that the simple treatment of stock required to render them available as human food is not comparable with the preliminary treatment necessary to convert wheat into flour.

The units of distribution of foodstuffs have been used in calculating the quantities of nutrients available. In the case of meats dressed carcass weights have been used. Average figures of the dressed weights of the same type of carcass vary considerably with district and season. The following average figures have therefore been used for the dressed weights and percentages of the stock population slaughtered annually (Table IV). The figures for pigs are based on two litters *per annum*.

TABLE IV.

Percentage of Stock Slaughtered Annually and Average Dressed Weight.

Observation.	Sheep.	Lambs.	Cattle.	Calves.	Pigs.
Annual slaughter *per centum* of population ..	8·23	6·86	16·08	13·69	141·2
Dressed weight (pounds) ..	40·0	30·0	480·0	48·0	125·0

Some obvious limitations of the data considered are as follows.

1. Statistics are available only for foodstuffs passing through normal trade channels. These are incomplete, as they give no information with regard to perishable green vegetables and fruit. Figures for home production are not available. This may be important with respect to eggs, poultry, milk and certain vegetables and fruits in some districts.

2. Losses in cooking have not been considered. These may be large with respect to minerals and vitamins in certain vegetable foodstuffs. This introduces an error in the opposite direction to that due to neglect of home production and of items for which data are not available. Calculations are based on the composition of foodstuffs as obtained by retail purchase.

3. Foodstuffs which make only insignificant contributions to the total requirements of nutrients have been neglected in considering the individual areas. They have been included in considering the production of the State

as a whole. Among these foodstuffs are pome fruits and fruits produced only in small quantity (annual production 86 pound per head), poultry, rabbits, and fish (aggregate annual production of 12·5 pounds per head).

4. The figures used are based on annual production. There are, however, great seasonal variations in the production of some foodstuffs. Locally available annual production at a satisfactory level does not exclude the possibility that there may be periods of the year during which the available quantities of certain nutrients may be considerably below the RDA.

In view of the range of variation of the composition of foodstuffs as bought, any minute subdivision into different items would serve no useful purposes. The foodstuffs considered have therefore been placed in the following groups: (i) dairy products: milk, butter, cheese, eggs; (ii) meat: beef and veal, mutton and lamb, pigmeat;

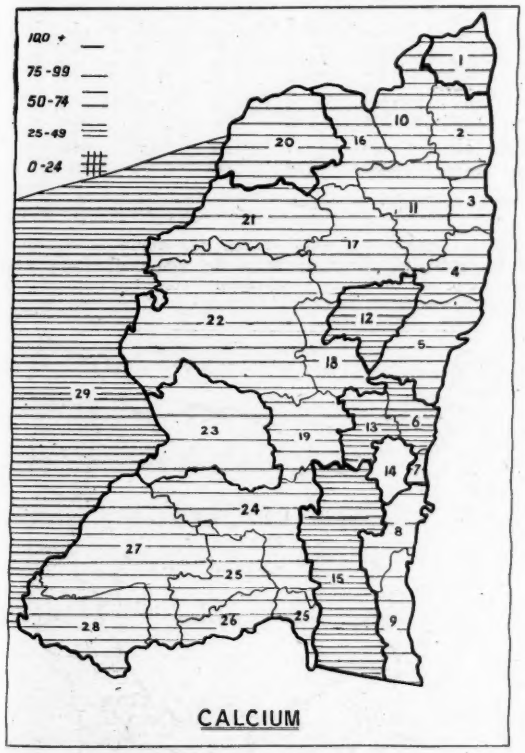

FIGURE V.

(iii) green and yellow vegetables: carrots, parsnips, pumpkins, tomatoes, cabbage, peas, string beans; (iv) other vegetables: potatoes, sweet potatoes (white), cauliflower; (v) fresh fruits: oranges, mandarins, lemons, bananas; (vi) dried fruits: vine fruits, apricots, prunes; (vii) cereals: flour; (viii) honey, sugar. The annual productions of these various foodstuffs, in terms of their distribution units, are given in Table V.

NUTRIENT CONTENT OF FOODSTUFFS.

The nutrient content of the different foodstuffs is expressed in terms of raw edible material as prepared by the housewife for cooking. In Table VI the factors for converting gross distribution units into pounds of edible material are given. Foodstuffs which are completely edible and for which the distribution unit is the pound are not shown in the table. The edibility factors are from Bourne's (1938) tables for Australian foodstuffs.

The nutrient content of foodstuffs may be subject to considerable local and seasonal variation. Representative figures must therefore be chosen for purposes of calculation. These have been obtained largely from the data of Bourne (*loco citato*) for protein, fat and carbohydrate. The calorific values of the foodstuffs were calculated by multiplying the protein, fat and carbohydrate content in grammes by Atwater's (1887) original factors 4·0, 9·0 and 4·0 respectively. Maynard (1944) and Slater (1945) have pointed out that these factors apply to the foodstuffs as ingested, while the frequently used Rubner factors of 4·1, 9·3, 4·1 apply to the materials actually absorbed.

Data for mineral and vitamin contents of Australian foodstuffs are meagre. Compilations based on British and American data have of necessity been drawn upon. The limitation of the applicability of these figures to Australian materials is fully realized. Among the available published data, those of Widdowson and McCance (1942) occupy an important place as they are based on original determina-

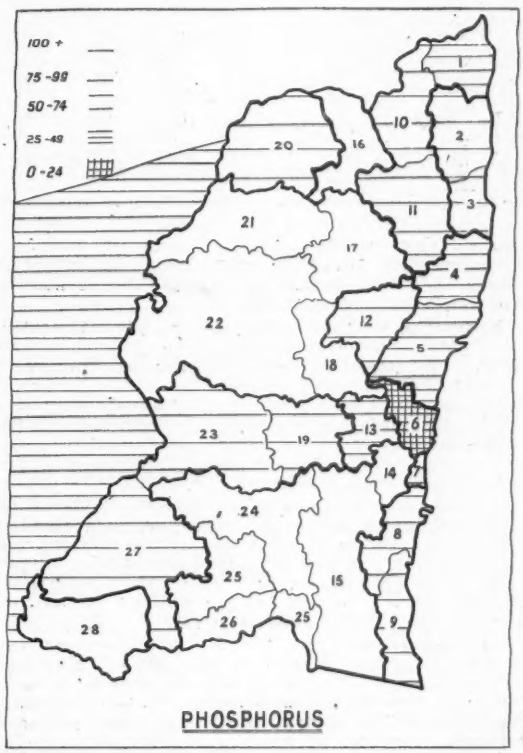

FIGURE VI.

tions. The compilations of Booher, Hortzler and Hewston (1942), of Pyke (1942), and of Marston and Dawborn (1943), have also been used. The figures used do not differ materially from those selected by Osmond (1946) for Australian foods. They are given in Table VII.

The iron content given is the total iron content. In many foodstuffs, for example, in meat, the principal iron-containing foodstuff, the absorbable or available iron is only a small fraction of the total. McCance and Widdowson (1944) have drawn attention to the unsatisfactory state of our knowledge of the iron requirement of the body. Their investigations have shown the extreme efficiency with which the body conserves its supplies of iron, and also the fact that the results of so-called balance experiments have little meaning. The actual requirement of the adult body may be only a small fraction of the RDA.

Uncertainty also exists as to the value of different foodstuffs as sources of vitamin *A*. This applies especially to vegetable foods, from which vitamin *A* is derived largely from their provitamin or carotene content. The

Annual Production of Foodst

Foodstuff.	1 Lismore. (90,720)[1]	2 Grafton. (38,430)	3 Kempsey. (28,900)	4 Taree. (38,360)	5 Newcastle. (266,810)	6 Sydney. (1,447,850)	7 Wollongong. (57,730)	8 Nowra. (19,730)	9 Bega. (17,780)	10 Tenterfield. (20,120)	11 Armidale. (28,350)	12 Muswe brook (22,20
Butter (1000 pounds)	39,400	9,300	7,200	12,800	10,065	—	—	—	4,900	914	—	—
Cheese (1000 pounds)	—	228	7,802	—	571	—	—	—	3,638	—	—	—
Milk (1000 gallons)	2,048	877	649	862	6,106	18,148	1,322	456	406	456	640	50
Pig meat (1000 pounds)	13,400	3,190	3,770	4,940	2,830	2,700	1·9	53	214	686	285	1,03
Mutton (1000 pounds)	0·5	3·6	1	12	67	183	173	1,540	227	3,896	11,428	7,61
Beef (1000 pounds)	45,900	20,900	14,200	21,500	21,900	5,830	5,830	5,760	8,800	11,130	9,387	9,03
Eggs (1000 dozen)	1,841	963	715	835	5,480	24,590	797	550	461	335	610	64
Sugar (tons)	27,250	15,270	—	—	—	—	—	—	—	—	—	—
Honey (1000 pounds)	379	66	61	145	249	59	14	37	71	138	37·8	1
Oranges and mandarins (bushels)	500	3,500	1,200	29,100	280,000	172,000	100	400	200	—	—	30
Lemons (bushels)	140	390	290	6,110	88,300	75,400	160	180	150	40	20	10
Bananas (bushels)	723,000	221,000	101,600	4,800	1,100	—	—	—	—	—	—	—
Dried vine fruit (1000 pounds)	—	—	—	—	0·4	—	—	—	—	—	—	—
Dried apricots (1000 pounds)	—	—	—	—	—	—	—	—	—	—	—	—
Dried prunes (1000 pounds)	—	—	—	—	—	—	—	—	—	—	—	—
Flour (short tons)	—	—	—	—	20	—	—	—	—	—	—	—
Potatoes (tons)	1,070	4,640	1,530	300	1,920	1,530	90	400	300	1,640	10,510	2
Tomatoes (1000 pounds)	22	990	4,081	117	1,380	3,610	19	34	3	147	14	2
Parsnips (tons)	—	—	3	6	89	271	7	20	12	58	95	
Carrots (tons)	44	25	29	12	666	507	28	79	77	121	150	
Sweet potatoes, white (tons)	1,568	31	14	11	329	503	—	—	—	1	—	1
Cabbage (tons)	36	20	260	280	1,990	4,767	9	45	30	306	230	12
Cauliflower (tons)	37	16	37	27	1,040	4,785	87	21	16	70	74	
Peas (tons)	99	62	265	25	219	796	—	295	307	955	1,866	
Beans, string (tons)	528	48	100	54	519	689	47	271	119	196	79	
Pumpkin (tons)	537	266	282	947	4,110	8,234	27	120	298	436	507	1

[1] Figures in parentheses are the populations of the regions mentioned.

different carotenes differ in the amount of vitamin *A* which they yield on scission in the body. The proportion of vitamin *A* from ingested carotene which is absorbed from the intestine also varies.

The fraction of the thiamine and ascorbic acid contents of the different foodstuffs which is actually obtained also varies. The important losses of thiamine which occur in cooking of flour, for example, have been shown by Francis *et alii* (1941), and the extreme lability of the ascorbic acid content of certain green vegetables has been demonstrated by Robinson and Courtice (1940).

Levels of Available Locally Produced Nutrients.

The available quantities of the different nutrients produced annually in the several areas have been calculated from the annual local production of the various foodstuffs and from the average annual consumption of each. These figures are given in Table VIII. The percentages of the RDA which the available quantities of nutrients represent are shown in the table also.

The percentages of the RDA of the different nutrients available in each area are also shown graphically in Figures I to X. For clarity only five grades are shown. Where the available quantity of a nutrient exceeds or equals the RDA, the area is left unhatched (grade I). Increasing densities of hatching indicate 99% to 75%, 74% to 50%, 49% to 25% and less than 25% of the RDA —grades II, III, IV and V respectively.

The distribution of available production with respect to population and area is considered later. The information with respect to the numbers of districts in the various grades is summarized in Table IX.

To make possible a general comparison of the different districts, the aggregate levels of the several nutrients have been calculated as described by Riggs *et alii* (1943) in their survey of levels of nutrition in East York (Canada). These aggregate figures are calculated from the average percentages of the different nutrients. Where the production exceeds the RDA, the figure used is 100. This is done to prevent undue influence on the aggregate of nutrients available in excess. In general, excess of one nutrient can compensate for deficiency of another only to a limited extent. A somewhat similar method for making a general comparison of areas has been used by Clements *et alii* (1945) in their survey of dietary status of Australian households. However, these authors calculated aggregate deficiencies, not aggregate levels of nutrients. The aggregate levels of available nutrients are shown for each district of the present survey in Table X.

Where deficiencies exist, these are made good, wholly or in part, in several ways. In some districts home grown products make significant contributions to the

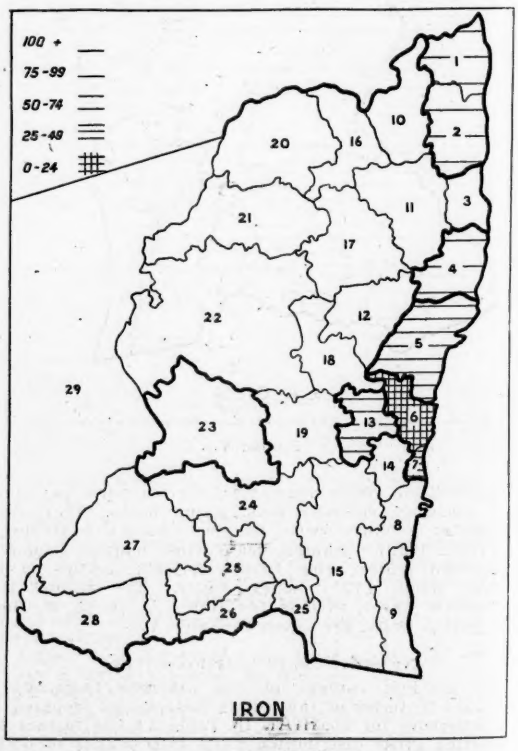

FIGURE VII.

required amounts of nutrients. For the whole population this contribution is probably small. Foodstuffs which have been disregarded as insignificant also contribute to the available supplies. Some of these contributions are not

Regions of New South Wales.

13 Bligh. (1,760)	14 Moss Vale. (26,120)	15 Goulburn. (58,970)	16 Inverell. (18,740)	17 Tamworth. (47,970)	18 Mudgee. (22,210)	19 Orange. (69,870)	20 Moree. (16,380)	21 Narrabri. (16,770)	22 Dubbo. (60,770)	23 Forbes. (43,190)	24 Cootamundra. (63,030)	25 Wagga. (48,310)	26 Albury. (31,960)	27 Leeton. (47,900)	28 Deniliquin. (14,110)	29 Western Division. (54,900)
—	1,031	—	232	—	378	—	—	—	—	—	3,500	1,900	—	—	—	46
—	3,367	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
659	604	1,318	426	1,083	508	1,593	373	383	1,378	990	1,430	1,094	729	1,093	324	1,005
213	669	351	497	948	210	110	10·8	26	920	121	204	158	79	68	25	358
840	734	23,800	8,290	15,600	7,710	13,630	17,250	12,800	33,500	16,000	20,400	13,300	5,520	14,300	5,800	32,910
360	3,980	11,190	5,280	7,450	2,310	4,910	5,770	3,120	7,420	3,620	9,460	7,840	3,940	3,710	1,980	6,550
327	1,126	150	390	2,044	587	1,501	248	384	1,605	1,096	2,046	1,237	875	1,012	334	73
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
80·6	51	231·7	180	136	1,411	501	5	0·6	101	24	1,861	54	201	18	15	3
800	4,000	—	200	100	—	100	—	300	800	100	100	300	1,200	29,300	2,600	132,638
520	2,930	—	170	180	20	110	20	170	1,230	410	180	560	210	49,900	2,090	8,431
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	9	4	1,161	2,962	13,920
—	—	0·1	—	—	—	0·02	—	—	—	—	0·6	9	10	1,070	0·05	46
—	—	—	—	—	—	—	—	—	—	66	1,240	—	—	345	0·04	4
—	—	1,340	3,200	50,400	10,300	53,500	—	17,200	36,300	15,100	52,400	57,000	53,600	30,900	1,308	—
200	1,760	10,670	110	350	360	6,650	20	10	100	—	1,890	550	10	30	—	12
50	661	14	8	194	19	1,283	12	20	140	86	46	41	55	2,040	2,276	231
23	83	32	84	19	30	171	6	6	75	26	45	34	—	124	5	—
37	347	122	126	14	32	241	4	5	56	37	77	25	14	414	10	—
2	—	—	—	14	2	4	4	5	17	—	—	12	—	12	—	—
29	2,223	40	220	538	73	410	132	168	227	157	174	84	19	231	24	—
40	304	38	91	134	43	2,394	31	44	4	89	105	62	30	106	26	—
330	363	10	39	5	2	2,456	1	1	6	50	47	5	1	306	31	—
8	98	10	35	18	15	38	5	6	26	6	10	7	1	22	75	—
82	605	67	396	478	148	251	59	64	188	154	209	54	177	817	92	202

only small, but may vary greatly with the season. Any remaining deficiency must be made up by importation of materials from other districts, or from outside the State. These materials may be used directly as foodstuffs—for example, potatoes. They may be used in the manufacture of edible foodstuffs—for example, wheat. They may be used indirectly in the production of foodstuffs—for example, fodder for stock.

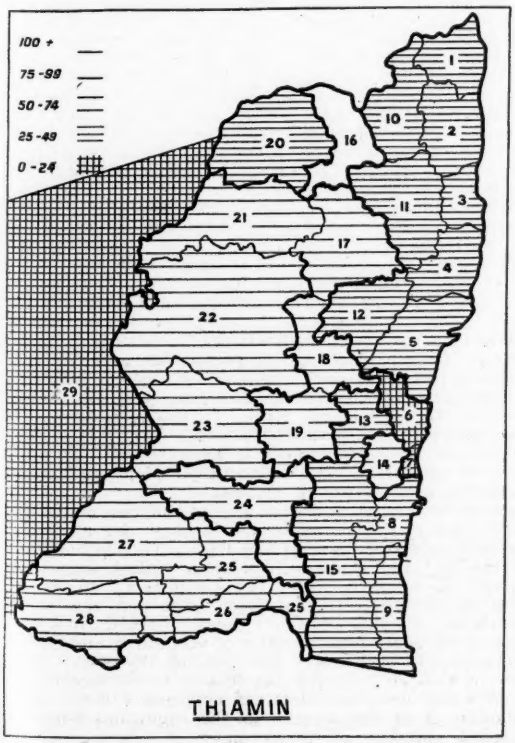

FIGURE VIII.

The data in Tables VIII, IX and X and in the Figures I to X thus give an indication of the extent to which the different districts of the survey are dependent on imports of foodstuffs to maintain adequate supplies of essential nutrients.

LOCALLY AVAILABLE PRODUCTION OF NUTRIENTS PER HEAD OF POPULATION AND PER UNIT OF AREA.

The density of production of locally available nutrients varies from district to district. It may be expressed in terms of population or area, and can be calculated from the data presented. The figures for the three main groups of areas—industrial area, rural area and Western Division—and the average figures for the State are shown in Table XI.

TABLE VI.

Factors for Conversion of Gross Units of Distribution to Edible Pounds of Foodstuffs. Foods not Specified in the Table are Completely Edible and Their Unit of Distribution is the Pound.

Foodstuffs.	Fraction Edible.	Unit of Distribution.	Factor for Conversion to Pounds Edible.
Milk	1·0	Gallons	10·3
Pigmeat	0·834	Pounds	0·834
Mutton	0·834	Pounds	0·834
Beef	0·834	Pounds	0·834
Flour	1·0	Short tons	2000·0
Eggs	0·98	Dozens	1·32
Sugar	1·0	Tons	2240
Potatoes	0·98	Tons	2195
Parsnips	0·60	Tons	1344
Carrots	0·68	Tons	1523
Sweet potatoes	0·98	Tons	2195
Cabbage	0·94	Tons	2094
Cauliflower	0·58	Tons	1295
Peas	0·42	Tons	985
Beans, string	0·98	Tons	2195
Pumpkin	0·70	Tons	1568
Oranges	0·73	Bushels	36·5
Lemons	0·76	Bushels	34·2
Bananas	0·65	Bushels	36·4
Prunes	0·85	Pounds	0·85

The figures in Table XI show that the locally available production per head of every nutrient considered is greater in the rural areas than in either of the other subdivisions. At one extreme is the available production of carbohydrate, which is over ten times as much as in either of the other divisions. At the other extreme is calcium, of which the rural population produces, for local

TABLE VII.

Nutrients per Pound of Foodstuffs (Edible).

Foodstuff.	Protein. (Grammes.)	Fat. (Grammes.)	Carbohydrate. (Grammes.)	Calories.	Calcium. (Milligrammes.)	Phosphorus. (Milligrammes.)	Iron. (Milligrammes.)	Vitamin *A*. (International Units / 1000)	Thiamine. (Microgrammes / 100)	Ascorbic Acid. (Milligrammes.)
Butter	5·0	390·0	—	3540	63	111	0·9	15·0	—	—
Cheese	107·0	132·0	—	1660	4000	2500	4·0	4·0	—	—
Milk	15·0	16·0	22·5	345	540	425	0·3	1·0	1·5	5
Pigmeat	70·0	120·0	—	1430	30	860	22·0	—	13·5	—
Mutton *et cetera*	70·0	70·0	—	950	27	1200	22·0	0·1	4·0	—
Beef *et cetera*	70·0	70·0	—	950	27	1200	22·0	0·23	3·0	—
Eggs	54·0	47·0	—	660	240	960	11·5	7·6	9·0	—
Sugar	—	—	450·0	1780	—	—	—	—	—	—
Honey	3·0	—	280·0	1170	—	—	—	—	—	—
Jam	3·0	—	280·0	1170	—	—	—	—	—	—
Oranges *et cetera*	6·0	—	31·0	148	180	150	2·0	0·65	1·5	250
Lemons	4·5	—	43·0	190	180	150	2·0	—	1·5	200
Bananas	8·6	2·3	84·0	400	31	130	2·0	0·36	1·8	50
Dried vine fruit	13·0	5·0	340·0	1500	270	143	7·0	—	6·0	—
Dried apricots	19·0	—	304·0	1330	400	530	18·0	20·0	—	—
Dried prunes	10·4	2·3	301·0	1300	170	390	13·0	18·0	—	—
Flour	45·0	4·0	350·0	1660	100	435	4·0	—	7·6	—
Potatoes	13·0	—	79·0	380	40	200	3·0	—	4·5	100
Tomatoes	8·2	—	30·0	156	50	100	2·0	10·0	1·0	100
Parsnips	9·1	—	64·0	300	200	200	2·0	0·9	7·6	100
Carrots	8·6	2·7	59·0	275	200	80	2·5	90·0	2·4	25
Sweet potatoes, white	7·3	—	95·0	420	90	200	2·5	—	2·4	70
Cabbage	9·5	—	26·0	145	200	130	2·0	4·0	2·4	200
Cauliflower	12·7	—	24·0	150	100	130	2·0	—	2·4	100
Peas	24·5	—	58·0	340	70	450	6·0	3·0	2·4	130
Beans, string	10·0	—	29·0	160	200	230	2·0	2·4	2·4	50
Pumpkin	6·8	—	37·0	181	100	200	4·0	6·0	2·4	10

consumption, only about 50% more per head than that of the other groups of areas.

When locally available production is considered in terms of unit of area, it is seen that the production in the industrial area exceeds that of the other for each of the nutrients considered. The available production of carbohydrate is 2·7 times that in the rural area, and over three hundred times that in the Western Division. At the other extreme is the production of vitamin *A*—18 times that in the rural area and over six hundred times that in the Western Division. The available production of calcium is also much greater per unit area in the industrial area, being over 16 times that in the rural area, and over three hundred times that in the Western Division.

The differences to be observed between the different areas are due mainly to the more intensive production of dairy products and fresh fruit and vegetables in the industrial area. This state of affairs is mainly the result of proximity to large centres of population, of better transport facilities and of more satisfactory water supply. The local production of the industrial areas is still, however, far fom adequate for the much more dense population.

The greatest deficiency of protein is to be seen in the industrial areas. In the coastal areas in general, available supplies of protein are low. This is due to the absence of cereal production in these areas, as wheat contributes nearly 40% of the total protein consumption of the State. In the belt of areas forming the Central Division of the State, where both wheat and livestock production are greatest, deficiencies of locally available protein are small or do not occur. Where they do occur, they indicate lower flour milling capacity rather than lower production.

The pattern of deficiency of locally available carbohydrate is similar to that of protein. It shows even more clearly the zone of the wheat belt, since flour supplies nearly two-thirds of the carbohydrate consumed in the State. Where deficiencies occur in these areas, they are due mainly to the lower flour milling capacity.

The Sydney district (area 6) shows the most serious deficiency in available fat production; but a belt of areas producing less than 50% of the RDA of their population extends from Sydney west and south-west. The areas of small or no deficiency are those in which the dairying industry, and particularly the production of butter, is best developed.

PROPORTION OF POPULATION AND OF AREA OF STATE AT DIFFERENT LEVELS OF AVAILABLE LOCALLY PRODUCED NUTRIENTS.

The data in Table VIII show that none of the population of New South Wales lives in areas in which supplies of carbohydrate, Calories or thiamine available from local sources attain 75% of the RDA. More than three-quarters of the population live in areas in which the available locally produced supplies of carbohydrate and of Calories amount to less than 25% of the RDA. More than half the population live in areas in which local supplies of six other nutrients are available at levels below 25% of the RDA (protein, fat, phosphorus, iron, thiamine and ascorbic acid).

When the aggregate nutrients are considered, it is seen that none of the population lives in areas in which these are available from local sources at or above the RDA. Rather more than one-third of the population have supplies of aggregate nutrients available at levels between 50% and 75% of the RDA. This information is summarized in Table XII.

When the available production of nutrients from local sources is considered with regard to area, a rather different picture is seen. In over 90% of the whole area of the State the population has iron available to it at least at the level of the RDA. In nearly a third of the area phosphorus is available at this level. In nearly a quarter of the area protein is available at least at the level of the RDA. The areas in question are the main meat producing areas of the State.

On the other hand, in over 60% of the area of the State, carbohydrate, Calories and ascorbic acid are available at levels of less than 25% of the RDA. This is mainly due to the fact that most of the flour milled is processed outside the areas in which the wheat is grown, and that most of the production of fresh fruit and vegetables is restricted to relatively small areas. In over 40% of the area of the State local supplies of vitamin *A* and thiamine are available at levels below 25% of the RDA. In the case of vitamin *A* this is due largely to the limited areas from which dairy products are obtained. In the case of thiamine it is due largely to the conditions controlling available supplies of flour.

CONTRIBUTION OF DIFFERENT GROUPS OF FOODSTUFFS TO NUTRIENTS.

In Table XIII the contributions of the different groups of foodstuffs to the nutrients available from local production are given in terms of percentages of the RDA.

The figures in the table show that meat is the most important source of available local production of protein (23·5% of the RDA). It supplies nearly half the available protein. Most of the rest is derived from dairy products (16·3%) and flour (6·4%); but the sum of the locally available protein is not quite half the RDA.

The principal sources of locally available fat are dairy products (24·9% of the RDA). Most of the rest is derived from meat (19·19% of the RDA); but the sum is less than half the RDA.

Flour is the principal source of locally available carbohydrate. It contributes 9·1% of the RDA. Dairy products (2·8%) come next.

Dairy products supply 10·8% of locally available Calories. Meat and flour, in that order, each supply rather less.

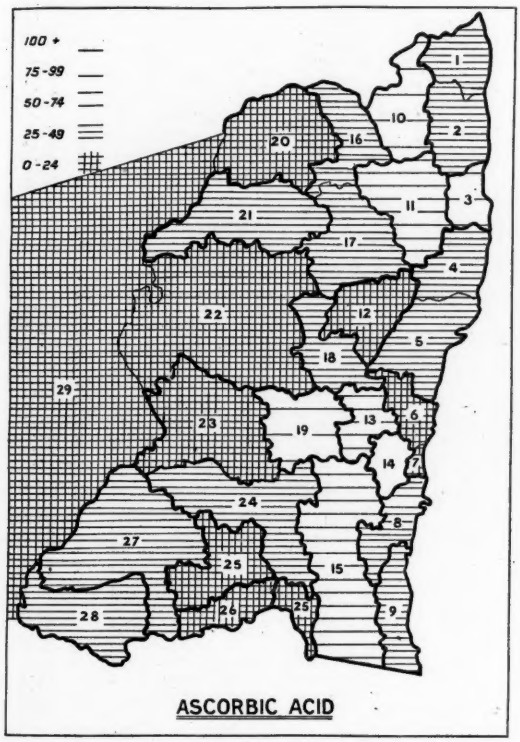

FIGURE IX.

Dairy products are by far the most important source of locally available calcium. They supply nine-tenths of the total; but this is only 41·0% of the RDA.

Dairy products and meat each supply about one-fourth of the RDA of phosphorus available from local sources.

Meat supplies most of the locally available iron (51·2% of the RDA). In spite of its low iron content, milk comes next, but its contribution is only 8·3% of the RDA.

Dairy products are the most important locally available sources of vitamin *A*. They supply 34·3% of the RDA. Green vegetables supply about half this amount.

Dairy products are also the most important sources of locally available thiamine (10·4% of the RDA). Meat (7·5%) and flour (6·4%) supply most of the rest.

Vegetables, green and other, together supply in about equal proportions 24·0% of the RDA of ascorbic acid. The principal contributors are potatoes. Fresh fruit and dairy products together supply 11·0% of the RDA.

The outstanding importance of dairy products in the diet is shown by the figures in Table XIII. They are the most important single source of locally available fat, Calories, calcium, phosphorus, vitamin *A* and thiamine, as well as of aggregate nutrients.

AVAILABLE NUTRIENTS IN THE STATE AS A WHOLE.

The figures in Table V for the total annual production of various foodstuffs in the different areas considered include only the quantities wholly produced in edible form within the areas. The sum of the production of the several areas does not necessarily represent the total production within the State. Under normal conditions of transport the materials required from outside of the areas concerned are readily obtained and freely used.

Any consideration of the nutritional status of New South Wales as a whole must, therefore, take into account the foodstuffs which are available by transport within the

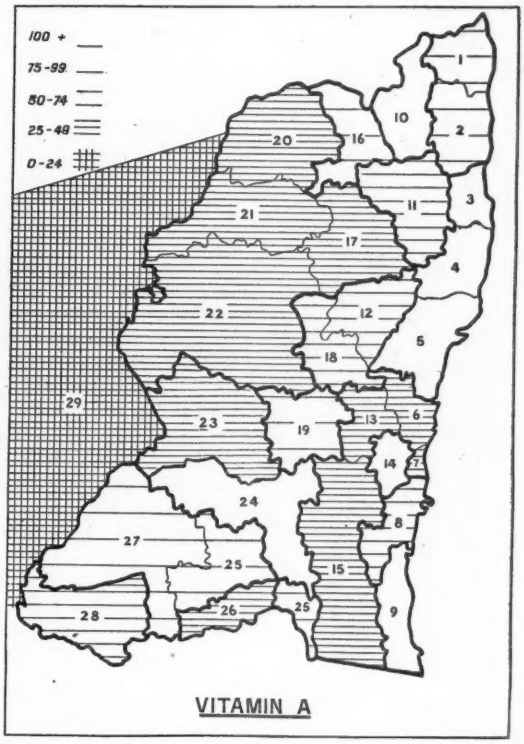

FIGURE X.

State and by importation from outside the State. The nutrients available in the State as a whole are the sum of the figures calculated from Table V, those obtained from materials imported from other areas, or from outside the State, those contained in the foodstuffs neglected as insignificant in quantity, and those contained in home grown foodstuffs. From this sum must be subtracted the nutrients contained in foodstuffs exported from the State and the quantities lost in the preparation of foodstuffs for consumption, storage and transport. The quantities of nutrients thus lost and the quantities gained from home grown foods cannot be assessed at present. They will to some extent balance one another, and have been neglected in this survey. The nutrients available within the State are for practical purposes those obtained by retail purchase from State grown and imported materials, less those exported.

The nutrient content of the foodstuffs in the three categories discussed, together with the percentage contribution of each category to the RDA of the population of the State, is shown in Table XIV.

TABLE VIII.

Total and Locally Available Annual Production of Nutrients in New South Wales, and Available Production as Percentage of RDA.

Protein.

Area.	Total. (Million Grammes.)	Available. (Million Grammes.)	Available. (Percentage of of RDA.
1	4,413	1,288	58·1
2	1,900	608	64·8
3	2,197	468	66·3
4	1,819	521	55·7
5	3,169	3,019	45·7
6	5,504	5,341	15·1
7	617	616	43·7
8	566	357	74·1
9	1,073	277	63·9
10	1,108	397	80·8
11	1,735	518	75·0
12	1,166	393	72·4
13	543	469	46·0
14	980	873	136·9
15	2,710	1,325	92·0
16	1,218	673	146·8
17	6,281	1,361	116·2
18	1,666	554	102·2
19	6,575	1,668	97·8
20	1,425	274	67·0
21	2,570	487	118·7
22	6,051	1,574	106·2
23	2,751	997	94·5
24	6,937	1,767	114·8
25	6,662	1,355	114·8
26	6,052	804	103·1
27	4,178	1,098	93·8
28	4,103	383	106·7
29	2,702	794	59·2

Fat.

Area.	Total. (Million Grammes.)	Available. (Million Grammes.)	Available Percentage of RDA.
1	19,899	2,451	89·5
2	5,420	1,071	92·4
3	5,204	796	91·1
4	6,937	1,036	89·5
5	6,915	6,830	84·8
6	5,139	4,996	11·4
7	617	617	35·4
8	540	342	57·4
9	3,035	497	92·6
10	1,399	723	119·1
11	1,388	471	55·0
12	1,200	403	60·1
13	410	410	32·5
14	1,359	1,313	166·7
15	2,316	1,165	65·4
16	1,052	608	107·5
17	2,150	987	68·2
18	955	515	76·9
19	1,879	968	45·9
20	1,422	271	55·6
21	1,158	346	68·2
22	3,098	1,104	60·2
23	1,509	636	48·8
24	3,912	2,538	133·4
25	2,705	1,674	114·8
26	1,163	544	56·4
27	1,558	682	47·2
28	859	254	57·2
29	2,600	829	50·0

Carbohydrate.

Area.	Total. (Million Grammes.)	Available. (Million Grammes.)	Available Percentage of of RDA.
1	30,877	5,740	44·9
2	17,174	2,640	48·8
3	925	536	13·1
4	432	339	6·3
5	2,884	2,383	6·3
6	6,053	6,053	3·0
7	389	339	4·2
8	239	216	7·8
9	220	186	7·4
10	560	322	11·4
11	2,158	422	10·6
12	156	156	5·0
13	835	660	11·2
14	718	532	14·5
15	3,191	1,725	20·7
16	2,462	1,488	56·4
17	35,704	3,750	55·4
18	7,807	1,751	56·0
19	39,441	6,029	61·2
20	104	104	4·4
21	12,148	1,298	54·9
22	25,821	4,677	54·7
23	10,856	3,356	55·2
24	38,217	5,219	58·8
25	40,291	3,820	56·1
26	37,767	2,487	55·2
27	23,000	3,768	55·8
28	28,475	1,181	57·0
29	5,165	317	4·1

TABLE VIII.—*Continued.*

Total and Locally Available Annual Production of Nutrients in New South Wales, and Available Production as Percentage of RDA.—Continued.

Calories.

Area.	Total. (Million.)	Available. (Million.)	Available Percentage of RDA.
1	332,164	51,629	60·8
2	126,059	23,300	64·8
3	60,899	11,766	43·4
4	73,142	13,553	37·8
5	90,945	87,374	35·0
6	103,225	101,228	7·5
7	10,302	10,301	19·0
8	8,617	5,790	31·4
9	33,250	6,685	40·2
10	20,117	9,831	52·2
11	29,425	8,576	32·2
12	17,161	6,472	31·1
13	9,948	8,929	22·8
14	19,809	18,180	74·4
15	46,678	24,068	43·6
16	25,256	14,787	84·3
17	193,185	30,766	68·5
18	48,097	14,486	69·7
19	207,409	41,392	63·3
20	19,885	4,275	27·2
21	71,544	10,756	68·5
22	160,758	26,678	46·9
23	70,558	24,301	60·1
24	222,447	52,696	89·3
25	218,515	37,217	82·3
26	189,236	18,950	63·4
27	126,757	26,867	59·9
28	142,038	8,960	65·1
29	57,304	12,805	24·9

Calcium.

Area.	Total. (Million Milligrammes.)	Available. (Million Milligrammes.)	Available Percentage of RDA.
1	17,427	13,186	49·8
2	8,055	6,640	59·2
3	36,603	4,890	57·8
4	7,042	5,636	50·3
5	43,985	41,220	52·9
6	115,433	114,707	27·1
7	7,798	7,798	46·3
8	3,127	2,880	50·0
9	17,665	2,894	55·7
10	3,620	3,108	52·9
11	5,573	4,145	50·0
12	3,520	3,134	48·3
13	6,070	5,860	48·0
14	18,866	17,586	230·6
15	9,544	8,380	48·6
16	3,837	3,256	59·5
17	17,888	7,977	56·9
18	5,493	3,651	56·3
19	21,960	11,590	56·8
20	2,754	2,310	47·2
21	6,151	2,749	56·1
22	16,790	9,866	55·6
23	9,487	6,911	54·8
24	20,568	10,462	56·8
25	18,649	7,849	55·6
26	15,346	5,071	54·3
27	14,838	7,846	56·1
28	10,901	2,348	54·7
29	11,341	6,123	38·2

Phosphorus.

Area.	Total. (Million Milligrammes.)	Available. (Million Milligrammes.)	Available Percentage of RDA.
1	76,267	25,354	71·6
2	33,235	11,889	79·2
3	42,879	9,094	80·4
4	32,110	10,649	71·1
5	65,834	61,721	52·9
6	126,650	123,744	21·9
7	12,899	12,899	57·2
8	10,559	6,939	90·0
9	21,637	5,498	79·2
10	19,086	7,475	95·1
11	30,373	9,921	89·6
12	20,573	7,533	86·9
13	10,941	9,593	58·8
14	19,797	18,019	176·6
15	47,158	23,811	103·4
16	19,432	10,923	149·2
17	75,450	34,000	181·5
18	22,408	8,859	102·1
19	78,886	26,304	96·4
20	25,078	5,348	81·6
21	33,174	7,878	120·2
22	81,510	25,035	105·6
23	38,764	15,860	94·9
24	86,362	28,444	115·5
25	77,762	21,831	115·7
26	60,550	12,898	103·3
27	53,099	17,479	93·4
28	44,349	6,128	106·7
29	47,133	15,312	71·4

TABLE VIII.—*Continued.*
Total and Locally Available Annual Production of Nutrients in New South Wales, and Available Production as Percentage of RDA.—Continued.

Iron.

Area.	Total. (Million Milligrammes.)	Available. (Million Milligrammes.)	Available Percentage of RDA.
1	123	30	92·1
2	52	14	99·4
3	41	11	103·7
4	52	12	91·9
5	65	60	63·4
6	72	69	13·4
7	13	13	62·6
8	15	9	126·9
9	20	6	100·2
10	32	10	137·5
11	48	13	126·3
12	34	10	124·7
13	11	10	64·1
14	16	14	149·7
15	74	32	153·9
16	30	15	227·5
17	89	27	161·9
18	28	10	131·2
19	87	29	117·0
20	43	7	113·1
21	44	10	167·0
22	109	30	140·1
23	51	17	114·3
24	104	35	155·5
25	88	27	157·2
26	62	15	133·9
27	65	19	113·6
28	52	7	140·0
29	84	20	105·4

Thiamine.

Area.	Total. (Million Milligrammes.)	Available. (Million Milligrammes.)	Available Percentage of of RDA.
1	39	11	29·7
2	18	6	37·0
3	12	5	41·1
4	14	5	29·0
5	32	28	24·8
6	73	70	11·4
7	5	5	19·0
8	4	3	34·2
9	4	2	31·8
10	8	4	44·7
11	19	5	38·9
12	8	3	32·6
13	6	6	32·0
14	8	6	50·2
15	26	11	45·3
16	11	6	79·6
17	90	15	71·6
18	21	6	67·2
19	100	21	71·5
20	8	2	27·1
21	32	5	67·6
22	74	17	66·4
23	32	11	61·2
24	96	19	71·8
25	97	14	67·8
26	87	8	62·5
27	58	13	61·7
28	65	4	65·2
29	24	5	22·2

Ascorbic Acid.

Area.	Total. (Million Milligrammes.)	Available. (Million Milligrammes.)	Available Percentage of RDA.
1	2,006	524	27·1
2	1,633	553	67·5
3	1,142	607	98·3
4	586	355	43·4
5	5,240	2,665	46·9
6	6,756	6,756	21·9
7	115	115	9·3
8	216	175	41·6
9	166	141	37·1
10	699	407	95·0
11	2,721	450	74·5
12	113	113	23·9
13	1,001	611	68·7
14	1,602	668	120·0
15	2,445	646	51·4
16	173	167	41·8
17	412	339	33·1
18	153	151	31·8
19	2,509	1,163	78·1
20	87	87	24·4
21	107	107	30·0
22	240	234	18·1
23	155	155	16·8
24	610	601	44·7
25	240	240	23·4
26	73	73	10·7
27	1,073	407	39·8
28	311	83	26·3
29	1,349	209	17·8

TABLE VIII.—*Continued.*
Total and Locally Available Annual Production of Nutrients in New South Wales, and Available Production as Percentage of RDA.—Continued.

Vitamin A.

Area.	Total. (Million International Units.)	Available. (Million International Units.)	Available Percentage of RDA.
1	663,000	97,000	79·0
2	182,000	48,000	91·6
3	208,000	39,000	103·6
4	229,000	41,000	79·2
5	446,000	403,000	111·3
6	668,000	645,000	38·8
7	27,000	27,000	34·9
8	26,000	19,000	71·7
9	114,000	24,000	110·3
10	53,000	36,000	133·4
11	49,000	28,000	73·2
12	22,000	17,000	57·4
13	32,000	23,000	41·0
14	128,000	60,000	167·9
15	37,000	35,000	44·3
16	37,000	23,000	89·7
17	47,000	30,000	46·0
18	25,000	22,000	71·5
19	93,000	74,000	78·0
20	11,000	9,000	40·4
21	12,000	10,000	44·6
22	47,000	38,000	46·4
23	33,000	27,000	46·3
24	128,000	94,000	110·4
25	60,000	54,000	82·8
26	22,000	18,000	41·3
27	140,000	53,000	82·1
28	33,000	11,000	53·0
29	24,000	19,000	24·8

Parry (1942) has assessed the production and consumption of nutrients in Australia as a whole along similar lines.

The figures in Table XIV show that the available foodstuffs produced in New South Wales contain protein, fat, carbohydrate, Calories, phosphorus, iron, vitamin *A* and thiamine in amounts at least as great as the RDA of the population as a whole. The quantities of protein, phosphorus and iron are considerably in excess of the RDA. These high figures are due largely to the high consumption of meat in the State. The quantities are increased still further by the nutrient content of imported foodstuffs. This is especially important for imported carbohydrates, which contribute an additional 25% of the RDA.

On the other hand, the quantities of calcium and of ascorbic acid in the available foodstuffs produced within the State are considerably below the RDA of the population. The figure for ascorbic acid is below the actual amount available, not only for the reasons given, but also because data are not available for the production of certain perishable sources of ascorbic acid such as lettuce. These sources, however, could not make good anything like the deficit shown. The addition of the ascorbic acid content of the imported foodstuffs brings the available quantity up to the RDA of the population. It is noteworthy that 35% of the RDA of ascorbic acid for the population of New South Wales is supplied by potatoes imported from other States.

The calcium content of imported foodstuffs, however, is small. When added to the quantity available from State production, the total is only 75% of the RDA. It is possible, of course, that the figures taken for the RDA of both ascorbic acid and calcium are too generous.

GENERAL DISCUSSION.

The distribution of nutrient production in New South Wales shows the existence of numerous local deficiencies in spite of a total available State production which is in general more than adequate for the needs of the population as a whole. Details of the distribution of individual nutrients have already been considered.

As has been found in older countries, the most serious deficiencies, in both degree of deficiency and range of nutrients, are found in the densely populated industrial areas. These deficiencies exist in spite of much more intense cultivation in these areas.

The figures in Table XIII show that protein, fat and carbohydrate are largely supplied by meats, flour, sugar

and butter. Since these foodstuffs can be transported and stored without loss of the three nutrients, local deficiencies of them are not important from the nutritional point of view under normal conditions of transport. In the event of another emergency, stocks could be accumulated at convenient distributing centres to ensure against the sudden occurrence of shortages resulting from breakdown of the transport system. As iron and phosphorus are mainly supplied by the foodstuffs mentioned and are not perishable, the same considerations apply to them.

TABLE IX.

Numbers of Districts in Different Grades, Expressed as Percentages of the RDA of the Various Nutrients, and Their Aggregate Levels.

Nutrient.	Grade I.	Grade II.	Grade III.	Grade IV.	Grade V.
Protein	10	5	9	3	1
Fat	5	7	11	4	1
Carbohydrate ..	0	0	12	2	15
Calories ..	0	3	12	10	4
Calcium ..	1	0	20	8	1
Phosphorus ..	11	11	6	0	1
Iron	22	3	3	0	1
Thiamine ..	0	1	12	12	4
Ascorbic acid ..	1	3	4	12	9
Vitamin *A* ..	6	7	5	10	1
Aggregate ..	0	4	20	4	1

The position with regard to calcium is rather different. Dairy products, and especially milk, supply more than three-quarters of the State consumption of the nutrient, which reaches only 75% of the RDA for the State area as a whole. As milk cannot be transported and stored without special facilities, the relatively smaller deficiencies of this nutrient would be of more serious consequence in the event of an emergency. Against this it will be noted that the calcium-phosphorus ratio is 1:2·7, or about twice that usually regarded as optimal.

The deficiencies of vitamins in locally produced foodstuffs are more serious. In the first place, considerable loss of ascorbic acid occurs during transport and storage. In the second place, the total State production reaches only 75% of the RDA, and is normally supplemented by considerable importation from other States.

TABLE X.

Grading of Aggregate Locally Available Production of Nutrients as Percentages of RDA. I, 100% or over: II, 75% to 100%: III, 50% to 75%; IV, 25% to 50%; V, less than 25%.

Area.	Aggregate Available Local Production.		Area.	Aggregate Available Local Production.	
	Percentage of RDA.	Grade.		Percentage of RDA.	Grade.
1	60·5	III	19	74·9	III
2	70·5	III	20	47·5	IV
3	69·2	III	21	69·0	III
4	55·4	III	22	64·8	III
5	51·3	III	23	63·2	III
6	17·2	V	24	82·1	II
7	33·2	IV	25	76·8	II
8	54·8	III	26	64·4	III
9	60·8	III	27	69·0	III
10	73·2	III	28	67·8	III
11	59·9	III	29	41·3	IV
12	51·8	III	Industrial area	22·8	V
13	42·5	IV			
14	83·9	II	Rural area	64·2	III
15	61·1	III			
16	81·1	II	Western Division	41·0	IV
17	70·0	III			
18	72·9	III	State	39·7	IV

The two most outstanding pieces of information to be gained from this work are the extent to which rural areas, the chief producing areas of the State, are dependent upon transport for the maintenance of satisfactory nutrition of their population, and the very important

TABLE XI.

Density of Locally Available Production of Essential Nutrients in Industrial Area, Rural Area and Western Division of New South Wales, and Average for State per Head of Population and per Square Mile.

Nutrient. (Annual Production.)	Industrial Area.		Rural Area.		Western Division.		Average for State.	
	Per Head.	Per Square Mile.	Per Head.	Per Square Mile.	Per Head.	Per Square Mile.	Per Head.	Per Square Mile.
Protein, 1000 pounds	5·22	821	22·5	115·6	14·5	6·3	11·0	97·6
Fat, 1000 pounds	7·09	1147	24·0	138·5	15·1	6·6	12·7	113·0
Carbohydrate, 1000 pounds	5·20	818	59·3	304·7	5·8	2·5	22·7	200·0
Calories, 1000	105·5	16,900	543·2	2930	273·6	94·6	249	2214
Calcium, 1000 milligrammes	108·4	14,700	163·0	890	111·5	48·8	120	1063
Phosphorus, 1000 milligrammes	114·6	18,000	401·0	2060	279·0	122·0	212	1886
Iron, 1000 milligrammes	0·084	13·2	0·46	2·36	0·36	0·16	0·21	1·87
Thiamine, 1000 milligrammes	0·060	9·5	0·23	1·17	0·09	0·04	0·114	1·02
Ascorbic acid, 1000 milligrammes	5·32	461	10·0	51·6	3·81	1·67	6·8	60·6
Vitamin *A*, million international units ..	0·60	94·7	1·02	5·27	0·35	0·15	0·73	6·5

TABLE XII.

Percentages of Total Area and of Total Population of State at Different Levels of Production of Locally Available Nutrients, Expressed as Percentages of RDA.

Nutrient.	Nutrient Levels.									
	100%+		75%+		50%+		25%+		25%−	
	Population.	Area.	Population.	Area.	Population.	Area.	Population.	Area.	Population.	Area.
Protein	11·35%	24·04%	9·76%	17·81%	11·88%	52·10%	13·27%	3·05%	53·55%	0·82%
Fat	6·39%	9·16%	18·25%	9·33%	13·53%	68·56%	9·43%	10·96%	53·55%	0·82%
Carbohydrate ..	—	—	—	—	17·57%	34·28%	4·68%	2·64%	78·90%	61·91%
Calories ..	—	—	—	—	17·47%	35·84%	4·68%	2·64%	78·99%	60·35%
Calcium	2·17%	4·17%	—	—	34·31%	46·17%	65·68%	48·49%	—	—
Phosphorus ..	14·63%	29·22%	12·80%	22·89%	19·94%	45·90%	—	—	53·55%	0·82%
Iron	26·76%	91·06%	6·07%	3·90%	13·27%	3·05%			53·55%	0·82%
Vitamin *A* ..	15·33%	9·44%	12·76%	13·98%	3·87%	8·77%	67·20%	26·14%	1·99%	40·50%
Thiamine ..	—	—	0·68%	1·40%	20·70%	38·22%	17·86%	14·99%	57·63%	41·46%
Ascorbic acid ..	0·95%	0·68%	4·31%	3·98%	6·10%	8·87%	24·08%	25·11%	65·71%	60·19%
Aggregate nutrients ..	—	—	3·91%	5·31%	36·96%	51·32%	5·59%	41·55%	53·55%	0·82%

TABLE XIII.

Percentage Contribution to RDA of Principal Nutrients of Available Local Production of Foodstuff Groups.

Nutrient.	Dairy Products.	Meat.	Green Vegetables.	Other Vegetables.	Fresh Fruit.	Dried Fruit.	Flour.	Preserves.	Total.
Protein	16·3	23·5	1·0	1·4	0·1	—	6·4	—	48·6
Fat	24·9	19·9	—	—	—	—	0·5	—	45·3
Carbohydrate	2·8	—	0·6	1·3	0·2	—	9·1	1·6	15·6
Calories	10·5	8·2	0·5	0·9	0·1	—	6·3	1·0	27·5
Calcium	36·9	0·8	1·2	0·5	0·3	—	1·3	—	41·0
Phosphorus	25·8	24·8	1·1	1·3	0·2	—	7·2	—	56·8
Iron	8·3	51·2	2·1	2·6	0·3	—	4·1	—	68·6
Vitamin *A*	34·5	1·1	15·7	—	0·2	0·1	—	—	51·5
Thiamine	16·4	7·5	1·3	2·9	0·2	—	6·4	—	28·8
Ascorbic acid	4·2	—	11·4	12·6	5·8	—	—	—	33·9
Aggregate	17·5	13·7	3·5	2·4	0·7	—	4·1	0·3	42·2

contribution that foodstuffs imported into New South Wales make to the people's diet. The importance of transport for the food supply of the industrial areas occasions no surprise. Nevertheless, the deterioration which may take place during transport is serious for many foodstuffs supplying ascorbic acid. It is obviously desirable that local production of these foodstuffs should be encouraged. This implies that developments of housing and growth of factory areas should not take place at the expense of the agricultural and horticultural parts of these areas.

Local production and decentralized marketing of fruit and vegetables are even more important for rural areas. Under present conditions, fruit and vegetables are often sold after transport back to the country from Sydney markets. Such double haulage must considerably lower the quantity of ascorbic acid available to the rural population, especially during hot weather.

Similar considerations apply to the distribution of milk, which is such an important source of calcium. Although a Milk Board ensures delivery of milk to industrial areas from considerable distances, there is no organized transport of milk for the supply of country towns. Some provision for the adequate supply of these areas is needed.

It should be pointed out finally that, although the nutrients produced in New South Wales when supplemented by those imported provide a diet adequate for the population of the State, except perhaps with regard to calcium, this cannot be taken to mean that all sections of the population are obtaining such a diet.

SUMMARY.

The supplies of ten important nutrients available to the population of New South Wales from local sources have been assessed. The nutrients considered are: protein,

TABLE XIV.

Nutritional Status of New South Wales as a Whole.

Foodstuff.	Protein. (Million Grammes.)	Fat. (Million Grammes.)	Carbohydrate. (Million Grammes.)	Calories. (Millions.)	Calcium. (Million Milligrammes.)	Phosphorus. (Million milligrammes.)	Iron. (Million milligrammes.)	Vitamin *A*. (Million International Units.)	Thiamine. (Million milligrammes.)	Ascorbic Acid. (Million milligrammes.)
Total Nutrient Production Less Nutrients in Exports.										
Dairy products	15,600	50,600	14,900		442,000	393,000	1,090	2,440,000	143	4,200
Meat	38,300	40,500	—		14,900	642,000	12,000	86,500	232	—
Sugar, honey	10	—	43,800	—	—	—	—	—	—	—
Fresh fruit	510	88	4,300	—	5,900	9,800	141	29,400	12	9,560
Dried fruit	37	—	770	—	735	1,250	42	52,500	—	—
Flour	39,100	3,560	314,000	—	85,300	389,000	3,460	—	660	—
Green and yellow vegetables	1,000	—	3,690	—	13,000	19,000	314	1,000,000	22	9,700
Other vegetables	1,600	14	9,300	—	6,200	24,300	362	—	53	12,400
Total	96,200	94,700	390,000	2,970,000	568,000	1,480,000	17,500	3,610,000	1,122	35,900
Percentage of RDA	143	114	100	108	70	137	179	96	96	61
Nutrients in Previously Neglected Foodstuffs.										
Cream	112	1,600	144	—	2,700	1,140	11	104,600	—	—
Flesh foods	3,200	1,000	—	—	1,100	44,000	700	4,000	16	—
Cereals	2,200	680	14,600	—	5,970	46,200	790	—	32	—
Fruits and vegetables	240	—	5,400	—	3,230	4,860	146	212,000	11	2,690
Total	5,750	3,280	20,100	133,000	13,000	96,200	1,700	321,000	59	2,690
Percentage of RDA	5·5	3·9	5·2	5·1	1·6	9·6	1·7	8·6	5·0	4·0
Nutrients in Imported Foodstuffs.										
Cheese	400	500	—	—	15,100	9,450	15	15,100	—	—
Potatoes	2,670	—	16,200	—	8,220	41,000	616	—	92	20,500
Sugar	—	—	80,200	—	—	—	—	—	—	—
Beef	2,900	2,900	—	—	1,130	50,200	920	9,620	13	—
Total	6,000	3,430	96,400	441,000	24,500	100,700	1,550	24,700	105	20,500
Percentage of RDA	8·9	4·1	25	17	3·0	9·4	16	0·7	8·9	35
Grand total	107,900	101,400	506,500	3,540,000	605,000	1,676,000	20,700	3,960,000	1,286	59,100
Percentage of RDA	160	122	131	137	75	156	213	106	109	101

fat, carbohydrate, Calories, calcium, phosphorus, iron, vitamin *A*, thiamine and ascorbic acid.

The State has been divided into 28 areas and the Western Division for the purpose of the survey. Values are based on the annual production of the more important foodstuffs in each area, and average consumption figures for the Commonwealth home production are not included.

Over 40% of the population live in areas from which an aggregate of less than 25% of the RDA of the different nutrients is available by purchase from local production. Over half the total area of the State furnishes available local supplies of the nutrients at an aggregate level less than 25% of the RDA.

The figures do not necessarily mean that the population is receiving a deficient diet. Deficiencies in available local production are normally made up by importation from other areas, from outside the State, and by home production. The figures do emphasize the uneven distribution of locally available products within the State, and the importance of problems of distribution.

The contribution of different groups of foodstuffs to the RDA of the various nutrients has been calculated. The importance of dairy products to the locally available production of protein (35%), fat (55%), carbohydrate (18%), Calories (38%), calcium (90%), phosphorus (45%), vitamin *A* (67%) and thiamine (36%) is emphasized by the figures.

Figures for the production of the State as a whole, less exports, show adequacy or abundance of the nutrients considered except calcium and ascorbic acid.

Imports (chiefly of potatoes) supply 35% of the State's requirement of ascorbic acid, and make good the deficiency, but raise the calcium level only to three-fourths of the rather generous RDA.

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Reports of Cases.

GANGRENE OF THE LEG FOLLOWING HIGH LIGATION OF THE GREAT SAPHENOUS VEIN.

By J. S. T. T. HILL,
Adelaide.

ON January 14, 1948, I performed a high ligation of the left great saphenous vein under general anæsthesia. The vein was injected distally with 20% saline solution. The patient was apparently fit; he was a labourer with bilateral varicose veins. An uncomplicated operation apparently precipitated arterial spasm which resulted in gangrene of the leg below the knee, necessitating amputation through the thigh.

Clinical Record.

I first examined the man, a naturalized German, aged forty-seven years, on October 20, 1947. He then complained that on the previous day he had suddenly developed blindness on one side when looking ahead, difficulty in matching nuts and bolts at work, and a difficulty in speech, so that knowing what he wished to say, he could not put it into words. Previously he had always been well, though he had had a course of injections for varicose veins of both legs, given by another doctor. I examined him with some care. A rough test showed the visual field of the right eye to be greatly reduced in all directions, the left eye being apparently normal. The cranial nerves, the reflexes, sensation and muscle action were normal. General examination and urine test revealed no fault; his blood pressure was 130 millimetres of mercury, systolic, and 70 millimetres, diastolic. He was referred to the out-patient department of the Royal Adelaide Hospital. The physician later telephoned me to say that he considered the condition to be a cerebro-vascular lesion. The patient had made an apparently complete recovery.

In December, 1947, he reported because his varicose veins were troubling him, and the previous doctor had said that operation might be necessary at some time. After examination, I suggested that he could postpone the operation, as the veins did not appear very bad.

In January, 1948, he again complained of aching pain in the calves towards the end of the day. The great saphenous veins of both legs were plainly visible and a little tortuous, more so on the left leg. Trendelenburg's test produced a positive response on both sides, and I advised ligation of the veins—fortunately suggesting that the left leg be treated first, and not both at one time.

On January 14, with the patient under ethyl chloride and "open" ether anæsthesia, I made an oblique incision, which was prolonged upwards to allow exposure of the sapheno-femoral junction. The branches were dissected out and divided between ligatures. The saphenous vein was tied with two ligatures where it entered the femoral vein. A fine soft rubber catheter was passed down the great saphenous vein for about eight to ten inches, and approximately twenty millilitres of 20% sterile saline solution

were slowly injected as the catheter was withdrawn (as advised by Professor Dodd, "Pye's Surgical Handicraft"). The vein was tied as the catheter was withdrawn. About half an inch of the vein was resected. The wound was closed with two catgut sutures to obliterate the dead space, and the skin with nylon sutures. Before the wound was closed the femoral artery was noticed to be pulsating strongly.

When the patient was being moved back to his bed, a small purplish stain was seen on the outer aspect of the dorsum of the left foot. That afternoon the patient complained of severe pain and I was called. I thought I could feel the posterior tibial artery pulsating, but as I was worried, I telephoned a senior consultant. He suggested spasm of the femoral artery and advised injecting 2% "Novocain" solution around the femoral artery. This I did early on the morning of January 15, with some relief of the fairly severe pain the patient was suffering in the leg. During the afternoon the discoloration became more definite, and the foot was cold. In the evening two consultants came down. They considered the condition to be established gangrene below the knee from occlusion of the common femoral artery. Pulsation could be felt just below Poupart's ligament, but no further.

On January 16 and 17 the femoral pulse improved and could be felt down to the mid-thigh. There was no palpable thrombosis of the saphenous vein. Mild cellulitis developed about the wound, which later discharged a little. On January 22 the left leg was amputated above the knee, the femoral artery at that site being occluded by a thrombus. Next day, above the left eye and in the left temporal area, there developed two small areas of purpura, possibly embolic. These disappeared in about six to eight days and the patient has progressed satisfactorily since.

Comment.

It would appear possible that this man was prone to arterial spasm, as he had previously suffered a transient cerebral upset. There was no doubt that the saphenous vein, and the saphenous vein only, was exposed. The femoral artery was not interfered with in any way. However, the dissection of the vein in the neighbourhood of the artery apparently precipitated an immediate spasm, with subsequent thrombosis. I had not used 20% saline solution as an injection before, but do not believe that this could have caused the damage. It is possible that the use of local rather than general anæsthesia would have protected the man from this vasospasm. I have reported this case on the suggestion of Sir Henry Simpson Newland, as it shows an unexpected and tragic sequel to an operation for a condition not usually regarded as dangerous.

Acknowledgements.

I should like to express my appreciation for the help, and particularly for the moral support, given to me by Sir Henry Simpson Newland, Dr. Russell Barbour and Dr. W. H. Baudinet.

Reviews.

AN INDEX OF TREATMENT.

THE first impression on looking through Beckman's book of eleven hundred odd pages on treatment in general practice is that of its comprehensiveness, as it seems to cover every pathological condition that may be encountered in general practice.[1] The author in his original preface deprecates the tendency in medical schools to emphasize diagnosis at the expense of treatment, and so this book took its origin. The sixth edition, which is the subject of this review, has been largely rewritten and especial attention has been paid to recent work on thrombosis and embolism, and on the reactions to penicillin. In spite of the completeness of the list of subjects, one is surprised to find no mention in the index or elsewhere of osteomyelitis, which is surely one of the important major illnesses of general practice; on the other hand considerable space (four pages) is devoted to treatment by streptomycin, which is surely the province of the specialist. Two pages are given to a discussion of the Kenny treatment of anterior poliomyelitis. In the article on deficiency diseases the author states that "the majority of the world's population has not and never has had enough to eat in terms of dietary adequacy". This subject is amply dealt with, and contains interesting tables of contributory factors to nutritional failure as a guide to appropriate treatment. Both the prophylaxis and the treatment of allergic manifestations receive adequate attention, and the author points out the need of psychiatric consultation owing to the possible existence of emotional disturbances underlying the physical condition. Of great interest to the general practitioner is the article on fibrositis; the author states that "fibrositis deserves a more dignified position in medical literature". He deprecates the use of the terms "muscular rheumatism" and "myositis" and regards fibrositis as a definite clinical entity of very common occurrence, and with definite ætiology and clearly defined lines of treatment. Included in the treatment he mentions the injection of procaine along with the use of physiotherapeutic measures. The author's statements are accurately documented all through and the bibliography alone occupies sixty-five pages. This book should rather be named an index of treatment, because of its comprehensiveness, its conciseness, its references to the literature, the setting up of the articles and subdivisions thereof. It is a useful book to have for immediate reference.

[1] "Treatment in General Practice", by Harry Beckman, M.D.; Sixth Edition; 1948. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9½" × 6", pp. 1146. Price: £4 0s. 6d.

MENTAL DEFICIENCY.

IN the past there has been no better work on mental deficiency than that of A. F. Tredgold. Although it may have seemed that he has written all that could be written on the subject, a new edition is always welcome, particularly when it includes new material and references to new acts to deal with an age-old problem, as educational authorities gradually awake from their lethargy to a realization of their responsibilities towards those who are inarticulate, unfranchised and incapable of looking after themselves. Furthermore, this book rapidly goes out of print, so authoritative and instructive is it. Further editions are always necessary so that a wider audience may be reached and more people brought to an understanding of the problems of the unfortunates who, previously, have stumbled through life, the objects of ridicule, cruelty and neglect.

In the seventh edition of "Mental Deficiency"[1] the author again deals comprehensively with the ætiology of amentia and its classification and once more devotes a chapter to the subject of the normal mind, a matter on which there are many individual psychiatric views and which often leads to heated expressions of opinion when psychiatrists forgather. This particular chapter is so concise, reasonable and logical that it should serve as the final word on the question. In addition, there are sections on pathology, physical characteristics and clinical varieties which should prove of interest, not only to the psychiatrist, but also to the general practitioner, who may be at a loss to decide what form of defect he is dealing with and what advice he should give to harassed parents. The highly controversial term "moral deficiency" is retained and much valuable material is included under this heading which should be of great assistance to those medical men called upon to assist the courts in determining the degree of criminal responsibility of an individual.

The treatment, training and sociological implications of mental deficiency are fully discussed. People who believe that amentia lies entirely within the province of the psychiatrist should read the chapter on sociology. They might then appreciate that it is a problem affecting everyone in some degree or other. Only too often the happiness of the normal child in the family is sacrificed, while affection and attention are lavished on the hopeless defective. Frequently the ament is permitted to produce replicas of himself to be a further burden on an already over-loaded community. The modern cry is "populate or perish", but we would certainly perish, intellectually, socially and economically, if we permitted this to continue. The cynic might say that we have enough *"idiots savants"* in high places already without adding to their number. The tragedy

[1] "A Text-Book of Mental Deficiency (Amentia)", by A. F. Tredgold, M.D., F.R.C.P., F.R.S. (Edinburgh); Seventh Edition; 1947. London: Baillière, Tindall and Cox. 8½" × 5½", pp. 550, with many illustrations. Price: 30s.

is that these mental defectives are often very fertile. Tredgold points out that it is exceptional for a feeble-minded woman to have only one child; more often there are three or four and sometimes five or six. In one area sixteen such women had produced a total of no less than one hundred and sixteen children. Surely this makes it a national, and not merely a psychiatric, problem. Every organization interested in social welfare should be familiar with this particular chapter.

This work is too well known to need any recommendation. The present edition carries on the tradition of accuracy, thoroughness and masterly presentation of the subject which we have come to expect from the author. It is a book which should be read not only by the specialist and the general practitioner, but by every person who has the welfare of the community at heart. It deals with a problem which might easily reach gigantic proportions to become an avalanche sweeping our whole social structure before it to destruction.

CLINICAL OPHTHALMOLOGY.

"CLINICAL OPHTHALMOLOGY" by Traquair is an unusual production.[1] As the author states in his introduction, it is an attempt to present ophthalmology in a very restricted and elementary manner to undergraduates and to general practitioners. It is a simple account of clinical ophthalmology without recourse to ophthalmoscopic examination. The first two chapters deal with anatomy and physiology and the succeeding eight chapters cover diagnosis, examination, abnormalities of the pupil, causation of eye affections, therapeutics, refractive errors and squint. The next seven chapters are devoted to various parts of the eye and its adnexa, each chapter commencing with a brief anatomical description of the part to be discussed. One chapter is devoted to glaucoma and the final chapters deal with impairment of sight without obvious external signs, functional ocular manifestations, the eye in infancy, childhood and old age, and finally misconceptions and prejudices. The book contains much useful information, several sections being particularly good, especially that dealing with headache. Many questions which patients often ask their doctor are answered.

Although the book is well produced and contains few errors, it is disappointing to find that a man so outstanding as the author should produce a text-book which neglects the use of the ophthalmoscope. In these days every undergraduate is taught the use of this instrument and the value and importance of ophthalmoscopic examination in clinical medicine are stressed.

RADIOGRAPHIC POSITIONS.

THE second edition of "Standard Radiographic Positions" by Nancy Davies and Ursel Isenburg has been received for review.[2]

This volume shows great improvement on the first edition. The text generally has been revised and the number of illustrations have been increased from 103 to 384. The great drawback to the work is the employment of line drawings, which do not give the same idea of depth as photographs, but, of course, photographs would have added greatly to the cost of production. It is quite a good working handbook and the instructions are clear. The addition of the size of films to the text should tend to film economy. A good working chart of exposures is added at the end of the book.

A new chapter on stereoscopic radiography is added, and the method of taking films and viewing them is described clearly. The authors state that mobile 30 milliampere units are not suited to repeated opaque meal work; it is quite wrong to attempt opaque meal work on these small units. A concise description of dark-room work and the various solutions employed is included. Detailed descriptions of preparation of patients for the various examinations are given.

The book should be of value to technicians and to those nurses who are frequently called on to take radiographs.

[1] "Clinical Ophthalmology: For General Practitioners and Students", by H. M. Traquair, M.D., F.R.C.S., Ed.; 1948. London: Henry Kimpton. 8½" × 5½", pp. 286, with illustrations, some coloured. Price: 25s.

[2] "Standard Radiographic Positions", by Nancy Davies, M.S.R., C.T., and Ursel Isenburg, M.S.R.; Second Edition; 1947. London: Baillière, Tindall and Cox. 8¾" × 6½", pp. 232, with many illustrations. Price: 21s.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Laboratory Technique in Biology and Medicine", by E. V. Cowdry; Second Edition; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 5¾", pp. 278. Price: 30s.

An alphabetical list of laboratory techniques and substances used in connexion with them.

"Foundations of Neuropsychiatry", by Stanley Cobb, A.B., M.D.; Fourth Edition; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 5", pp. 274. Price: 18s. 6d.

Intended "to give to practitioners and students of medicine the facts and correlations needed to understand the simpler workings of the central nervous system".

"Topics in Physical Chemistry: A Supplementary Text for Students of Medicine", by W. Mansfield Clark, Ph.D., Sc.D.; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 5", pp. 756, with illustrations. Price: 75s.

Deals with principles recognized as constituting "the core of chemistry".

"Vascular Diseases in Clinical Practice", by Irving Sherwood Wright, M.D.; 1948. Chicago: The Year Book Publishers Incorporated. 8" × 5", pp. 514, with illustrations. Price: $7.50.

Clinical studies of peripheral vascular conditions.

"Encyclopedia of Medical Sources", by Emerson Crosby Kelly, M.D., F.A.C.S.; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 5¾", pp. 484. Price: 56s.

An index to medical eponyms and original work.

"Skeletal Tuberculosis", by Vicente Sanchis-Olmos, M.D., translated from Spanish by John G. Kuhns, M.D., with a foreword by Frank R. Ober, M.D.; 1948. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" × 5¾", pp. 280, with illustrations. Price: 37s. 6d.

A study of what is "new or little known" of tuberculosis of bone.

"Ophthalmology in the War Years", edited by Meyer Wiener, M.D., and Contributors; Volume II (1944-June, 1946). Chicago: The Year Book Publishers Incorporated. 6½" × 9½", pp. 992, with illustrations. Price: $16.00.

An attempt to cover "everything of importance" in ophthalmological literature from January, 1944, to June, 1946.

"If Your Child is Deaf", by Irene R. Ewing, O.B.E., M.Sc., D.C.L., and Alex W. Ewing, M.A., Ph.D.; 1948. London: The Children's Society. 7" × 5", pp. 17, with illustrations.

A pamphlet of practical advice to parents of deaf children.

"Chest Examination: The Correlation of Physical and X-Ray Findings in Diseases of the Lung", by Richard R. Trail, M.C., M.A., M.D. (Aberd.), F.R.C.P. (Lond.), with a foreword by Sir Walter L. Langdon-Brown, M.A., M.D., F.R.C.P., D.Sc., LL.D.; Third Edition; 1948. London: J. and A. Churchill, Limited. 8½" × 5½", pp. 184, with illustrations. Price: 12s. 6d.

Intended to help the student undergraduate and post-graduate in the assessment of the changes going on in his living patient.

"A Short History of Ophthalmology", by Arnold Sorsby, M.D., F.R.C.S.; Second Edition; 1948. London: Staples Press, Limited. New York: Staples Press Incorporated. 7" × 4", pp. 116, with illustrations. Price: 8s. 6d.

A concise history of the main developments in ophthalmology,

"First-Year Physiological Technique", by Alex Comfort, M.A., M.B. (Cantab.), D.C.H.; 1948. London: Staples Press, Limited. New York: Staples Press Incorporated. 4½" × 7¼", pp. 94, with illustrations. Price: 7s. 6d.

On the management of apparatus and experiments in the physiological laboratory.

"The Radiology of Bones and Joints", by James F. Brailsford, M.D., Ph.D., F.R.C.P., F.I.C.S.; Fourth Edition; 1948. London: J. and A. Churchill, Limited. 9½" × 7", pp. 778, with illustrations. Price: 63s.

To show the changes in bones and joints during the progress of disease.

"A Handbook of Ophthalmology", by Humphrey Neame, F.R.C.S., and F. A. Williamson-Noble, F.R.C.S.; Sixth Edition; 1948. London: J. and A. Churchill, Limited. 9" × 6", pp. 348, with many illustrations, some of which are coloured. Price: 21s.

Intended for undergraduates and general practitioners.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

WAR-TIME MEDICAL RESEARCH IN ENGLAND.

UNDER ideal conditions scientific research is conducted in an atmosphere of detachment in order that knowledge may be increased. It is not common for research to be carried out in order to provide scientists with a particular agent or process that will enable man to obtain his security or peace of mind. When a piece of research with a set objective has to be staged, it sometimes happens that isolated observations of even a previous generation find an unexpected use in the problem under investigation. During the second world war medical research had often to be directed into channels of practical usefulness. This was evidenced in the documents issued from time to time during the conflict by the Medical Research Council of Great Britain. The activities of this Council have been described in a special report, covering the years 1939 to 1945, which calls for particular notice.[1]

The previous report of the Medical Research Council described the work carried out under its ægis between October, 1938, and September, 1939. (See THE MEDICAL JOURNAL OF AUSTRALIA, June 29, 1940.) In the introduction to the present report the reader is told that the special duties undertaken by the Council as its contribution to the war effort were of two kinds. In the first place a great increase took place in the demands made on the Council for advice to government departments and the fighting services in regard to the application of the latest scientific knowledge to practical affairs. In some of the matters the assistance given went beyond advice and the Council had to assume certain administrative functions of great importance. In the second place work was naturally directed in an increasing degree to the solution of special war-time problems. Many of these problems called for quick solution, "and the more academic researches that properly hold an important place in a long-term programme were fewer". In this connexion it is interesting to recall a statement in the Council's 1938-1939 report that it was not blind to the danger that by a switching over to objectives of immediate practical interest the fruits of promising research unrelated to war might be lost. In the present report we read that with the *ad hoc* type of investigations there comes a time when the research worker has to decide whether to confine his interests to the giving of limited answers, or to delve more deeply in order to obtain, albeit more slowly, a fuller grasp of the principles involved. "So it is that, although war acts at first as an intense stimulus to certain branches of medical research, in the long run it tends to lose its effect as an incentive to discovery." The late war was beginning to lose much of its stimulating influence on medical research when it ended. At the same time the harvest, we are told, has been great and under conditions of peace will bring much benefit to mankind. Nowadays it is a commonplace to hear the lament that the advances in science are applied to man's undoing and destruction rather than to his betterment. It is therefore encouraging to read the view expressed by the Medical Research Council that the advances in medical science before and during the late war have been impressive, and that, until the introduction of atomic weapons in the final stage, the claim that the advances in the saving of life in war-time had been at least as great as the advances in the methods of destruction, would not be unreasonable. The Council refers to a somewhat similar statement in its 1938-1939 report that if a strict comparison was made between what science had done to increase war mortality and what medical science had done to lessen these lethal effects, there was good reason to believe that the latter would be an easy winner. From this comes a challenge for the future and it is no exaggeration to say that man's welfare in the years to come will depend on the use to which he puts the powerful weapon of atomic energy.

Medical research has been referred to as having provided a rich harvest. The report sets out in different categories the work accomplished. The practical outcome was shown in regard to personnel in the recent war and we are referred in this connexion to the campaign in north-western Europe in 1944-1945. During this campaign a British soldier wounded on the field of battle had, because of "medical methods of defence", a 93% chance of survival; the chance of his recovery to a degree fitting him for a reasonably wide range of civil employment, was about 84%. The Council points out that the response of medical science to the challenge of war has three main objectives. In the first place it must be directed to maintaining the health of the armed forces and of the civilian population, particularly in the prevention of infective diseases and of malnutrition. Secondly, methods for the rapid restoration of the wounded and sick to full health must be studied. Thirdly, conditions must be found such as are required for the highest possible efficiency, safety and comfort of fighting personnel and of industrial workers in all the circumstances and tasks of war. It will not be possible to attempt even a short outline of what was accomplished in these directions during the six-year period under review. The mention of some of the main spheres of activity will, however, give some idea of the wide range of activities undertaken. The infective diseases to which

[1] "Medical Research in War: Report of the Medical Research Council for the Years 1939-45"; Committee of Privy Council for Medical Research; Presented to Parliament December, 1947. London: His Majesty's Stationery Office. 9½" × 6", pp. 455. Price: 7s. 6d. net.

troops were exposed included malaria, typhus, typhoid fever, dysentery, smallpox and yellow fever; there were other diseases found in temperate climates. The important work done in respect of mite-borne scrub typhus, epidemic jaundice and malaria needs only to be mentioned to be recalled to readers of this journal. We are told that the application of nutritional principles was one of the most interesting events of the war and that never before had troops been fed so well. The difficulties of feeding the civil population in Britain were, of course, enormous, and the ways in which these were met may be described as the application of medical knowledge by wise administration and rationing. In the restoration of the wounded and sick the application of sulphonamide drugs to wounds and the use of penicillin are most noteworthy. Also of the greatest importance were the control of cross-infection in hospitals and the work on blood transfusion and traumatic shock. In regard to service personnel, organized research was directed to the interest of the individuals engaged in war activities. This work began in the Royal Air Force and afterwards spread to the Army and the Navy, and later was used by the United States of America. The research was concerned primarily with the individual, and more particularly with the improvement of conditions, environmental and instrumental, to make him more efficient in his task and to give him the feeling of safety and comfort. The questions investigated varied greatly from high altitude flying to deep sea diving, and from work and clothing in the tropics to activities in the Arctic regions. In the matter of industrial health it is interesting to note that a good deal of attention has been paid to the psychological aspect. An Applied Psychology Research Unit was established mid-way during the war in the Psychological Laboratory in the University of Cambridge as a leading centre for investigations in experimental psychology applied to practical problems of human activity. In addition there were established a Department for Research in Industrial Medicine, a Pneumokoniosis Research Unit and a Toxicology Research Unit. Two important war-time developments of the work carried out by the Industrial Health Research Board are mentioned. The first was the widespread application of methods of research in industrial physiology and psychology to the personnel problems of the fighting services and conversely the finding that the results of many researches carried out initially for one or other of the services had far-reaching applications also to industry. The second major development was a substantial increase in the Council's programme of work on occupational hazards and diseases and a corresponding widening of the original terms of reference of the Industrial Health Research Board. The few points that have been mentioned show, as already stated, that an enormous amount of work was covered by persons connected with the Medical Research Council, and that the greatest possible credit is reflected on the members of the Council and of its executive committees as well as on the workers themselves. It may, at this stage, be useful to point out that findings of research workers have to be carried into effect and that the mistakes of one generation may be repeated in another. We can all recall how in the early days of the last war the lessons learned in the war of 1914-1918 on industrial fatigue were forgotten. The Medical Research Council itself draws attention to this fact and points out that surveys had to be made to establish known facts. This should make for humility on the part of everyone concerned.

Two facts remain to be recorded. The first is that the crises and emergencies of war had an important influence in shortening the customary time lag between the acquisition of scientific knowledge by research and its application to practical human problems. The second is that during the war the grant-in-aid received by the Medical Research Council rose from £195,000 in 1940-1941 to £295,000 in 1945-1946. No one will be so foolish as to say that the world today, with its unrest and deeply-rooted suspicion, is not in need of research to create a healthy outlook of mind among robust men and women —a real *mens sana in corpore sano*. The two facts just mentioned should continue to operate by the deliberate will of all concerned and this will at least mean that we are keeping our faces turned in the right direction. The lesson to be derived from this report is just as important for Australia as for Great Britain.

Current Comment.

AORTIC AND PULMONARY VALVULOTOMY.

THE surgeon has invaded the field of cardiology to no little effect in regard to certain lesions and he is casting his eyes on some other lesions for which the physician is able to do very little. Significant work on aortic and pulmonary stenosis has recently been reported. There are interesting possibilities in an account of experimental surgery carried out on the aortic valves of dogs by H. G. Smithy, H. R. Pratt-Thomas and H. P. Deyerle, of Charleston, South Carolina.[1] Their object was to devise a method of dividing the aortic valve so as to decrease the obstruction in aortic stenosis and possibly to extend the method to the mitral valve. The first method which they tried consisted in passing a specially devised valvulotome through the wall of the ascending aorta and manipulating it proximally within the aorta until it became engaged within one of the cusps of the aortic valve. By manipulation of the sliding barbed blade of the instrument, the valvular leaflet was divided, perforated, lacerated or partially avulsed. Several means of control of hæmorrhage were tried. This method has proved unsatisfactory because of a high mortality due to difficulty in controlling hæmorrhage, the uncertainty of producing an adequate valvular lesion and the presence of microscopic evidence that aneurysm formation was likely to follow. A safer, simpler and more effective method was subsequently worked out, in which the approach was made through the wall of the left ventricle, the same valvulotome being used as in the transaortic operation. For this the operative mortality was reduced to quite a small figure and uniformly satisfactory valvular lesions were produced; in addition the procedure is applicable, theoretically at least, to the treatment of mitral as well as aortic stenosis. The results so far obtained are, of course, in normal dogs, and the possibility of application to heavily scarred or calcified valves in man raises further questions. It is not felt that a simple incision in such a valve is likely to be effective, and in any case there is a real possibility that the incision will heal. For this reason Smithy and his colleagues are developing a small instrument designed to remove a segment of a fibrotic or calcified ring between strong biting surfaces. A further practical detail of importance was the observance of disturbances of cardiac rhythm during the manipulation of the valvulotome. The occurrence of ventricular fibrillation and tachycardia is obviously undesirable, but it is hoped to control more

[1] *Surgery, Gynecology and Obstetrics*, May, 1948.

serious arrhythmias by means of quinidine sulphate given before operation or by the topical application during operation of procaine. The final consideration of significance concerns the advisability of converting a stenosis into a regurgitation. Mitral stenosis is, of course, usually regarded as more harmful than mitral regurgitation, but the relative importance of aortic lesions is not so definite. However, attention is drawn by these investigators to the group of young adults with aortic stenosis sufficient to interfere substantially with their activities; their difficulties are inadequate left ventricular output which produces chronic hypoxia becoming acute during exertion, persistently low systolic blood pressure, and decreased coronary blood flow, all of which are the result of a small, contracted aortic valvular orifice. It seems likely that an operation to increase the size of the valvular outlet would benefit these patients, but at present there is no experimental means of confirming this possibility. However, the approach is a logical one and perhaps we shall see some practical clinical results before long.

Parallel work on pulmonary stenosis has been going on in England and is from the practical standpoint much more advanced. R. C. Brock, of Guy's Hospital, has presented a preliminary report[1] on three patients who have undergone pulmonary valvulotomy for relief of pulmonary stenosis; all survived the operation and received benefit, at least as far as the stenosis was concerned. Brock's paper will be available to the majority of our readers, so that it will suffice to refer only to the main points. In all cases a diagnosis of Fallot's tetralogy with pulmonary valvular stenosis was made; the degree of subvalvular stenosis was not easy to determine, though its significance in assessing the value of operation is obvious. The surgical approach was through the ventricular wall, first with a valvulotome and then with dilating forceps. Convalescence was unfortunately complicated in two instances by the effects of emboli in the brain and leg respectively, but in all cases notable improvement seems to have been effected in the patient's colour and cardiac function. Brock makes it clear that his operation is not meant to supplant the Blalock operation, in which a systemic artery is anastomosed to the pulmonary artery and the pulmonary stenosis is by-passed. It is, however, an alternate procedure appropriate to certain patients; it is of much shorter duration and overcomes certain possible disadvantages of Blalock's operation. No sweeping claims nor final conclusions are made, but Brock's paper must be regarded as a mile-post on an important road.

THE LOCAL APPLICATION OF SEX HORMONES.

SEX HORMONES have come more and more into general use despite the decided limitations of our knowledge of their actions. There is a strong temptation, on observation of a particular effect produced by the experimental use of a hormone on animals or its clinical use on a human patient, to seek that effect with scant regard for other actions that the hormone may have. One field in which this must be borne in mind is in the local application of sex hormones. Harold Speert[2] in a review of this subject points out that sex hormones can be absorbed in functional quantities from several of the body surfaces, and that in addition localized tissue response to the sex hormones can be elicited by the direct application of these compounds to some of the body surfaces and internal organs. Experimentally these localized effects may be produced without significant generalized response if the concentration and amount of hormone applied are appropriate. Clinically this fine adjustment of dosage is by no means always practicable, and in attempting local therapy with either œstrogens or androgens we must accept the fact that the amount of hormone applied, if it is to accomplish the desired local effect, will probably result in systemic absorption also. Speert covers in some detail the experimental work that has been carried out on the local application of sex hormones and also the reports on clinical effects observed. It is sufficient here to refer briefly to the clinical aspects. Œstrogenic hormones applied locally to the vagina have been found to be most effective for vulvo-vaginitis, especially in children, clinical cure being independent of obvious systemic absorption of the hormone; non-specific vaginitis in sexually mature women has been similarly treated with success, and gratifying results have been obtained with senile vaginitis. Dramatic and immediate cessation of uterine contractions has been claimed to follow the injection into the anterior lip of the cervix of large amounts of stilbœstrol in oil in cases of threatened abortion. In cases of hypomastia, cosmetic improvement has followed inunction of the breast with œstrogenic hormone preparations. Claims have been made for the cure of puerperal mastitis by stilbœstrol inunctions and for the relief of pain in cases of so-called chronic mastitis by androgen inunctions, but these require confirmation. Success has been reported (though not uniformly) in the treatment of *pruritus vulvæ* and of *kraurosis vulvæ* by the local application of œstrogenic ointment, but the possibility of carcinogenesis casts doubt on the wisdom of the procedure. The application of œstrogen and androgen preparations to the skin has been reported as beneficial for a variety of dermatological conditions, but the validity of much of this work is doubtful and some at least of the definite effects are probably due to systemic rather than local action. Speert draws attention to the inclusion of œstrogens in commercial cosmetics, an undesirable practice, firstly, because their beneficial effect on the skin is, to say the least, questionable, and, secondly, because of the unpredictable effects of their possible systemic absorption. This brings us back to the basic principles of this whole form of treatment. Not all of the reports on its clinical effectiveness have been confirmed, but it will doubtless be accepted eventually as of value in many instances, and presumably further clinical applications will develop from the present experimental research, but the question of absorption must be borne in mind at all times. There is abundant evidence that this occurs in both human and animal subjects, notably through the skin. With regard to the local œstrogen treatment for vulvo-vaginitis in young girls, Speert states that clinical experience reveals a relatively low incidence of undesired side effects; slight mammary enlargement and occasional uterine bleeding, when they do occur, can reasonably be regarded as mild and transient complications, whose importance is primarily psychological. The prescription of prolonged or repeated courses of œstrogenic inunctions for mature women requires, in Speert's opinion, more circumspection. The continuous administration of œstrogens interferes with normal ovarian function. Speert suggests that, as in many women with inadequate breast development (for whom œstrogen inunctions may be indicated for cosmetic reasons) ovarian function is already at a low level, this consideration is then unimportant. In others, however, in whom the mammary defect exists despite the presence of normally functioning ovaries, a depression of the latter is liable to result from treatment adequate for breast development. In women of the child-bearing age the possible impairment of their fertility, even though it is temporary, may well be a more important consideration than an augmented bust measurement. A stronger objection against prolonged œstrogen treatment is based upon its possible relation to carcinogenesis. In mice, and to a lesser degree in a few other species, sex hormonal factors appear to be of fundamental importance in the production of cancer, especially mammary cancer. The relationship is not so clearly established for man, but many case reports suggest that the possibility must certainly be considered. Speert considers that in the absence of more precise knowledge of the subject, a properly conservative attitude demands that prolonged œstrogen therapy, either local or systemic, be withheld from patients with a personal history of cancer of the breast or uterus, with a strong familial disposition to cancer, or with a precancerous genital lesion. The same type of reasoning leads to the conclusion that, until it can be clearly shown that they have no relation to the development of prostatic tumours, androgens should be administered to men with caution and for short periods of time, whether by injection or by inunction.

[1] *British Medical Journal*, June 12, 1948.
[2] *Physiological Reviews*, January, 1948.

Abstracts from Medical Literature.

GYNÆCOLOGY.

Precursors of Corpus Carcinoma Œstrogens and Adenomatous Hyperplasia.

S. B. GUSBERG (*American Journal of Obstetrics and Gynecology*, December, 1947) puts forward evidence in favour of a particular type of endometrial hyperplasia which under suitable conditions can progress to adenocarcinoma. The endometrium shows a papillary pattern of glandular activity which is constant in four related groups: (*a*) endometrial hyperplasia produced by granulosa cell tumours; (*b*) endometrial hyperplasia produced by prolonged œstrogen stimulation; (*c*) endometrial adenocarcinoma arising in patients receiving prolonged œstrogen administration; (*d*) endometrial patterns in patients with recurrent episodes of "functional bleeding". These four groups have œstrogenic stimulation of the endometrium as a common factor, and the authors produce data to show that the high incidence of endometrial cancer in these groups is the result of this stimulation to a particular type of endometrium.

A Correlation between Vaginal Smear and Tissue Diagnosis in 1045 cases.

N. P. ISBELL, J. F. JEWETT, M. S. ALLAN AND ARTHUR T. HERTIG (*American Journal of Obstetrics and Gynecology*, October, 1947) report the results of a study to determine the relative value of the vaginal smear in the discovery of cancer as compared to cervical biopsy and curettage, and to test the practicability of the method with reference to the amount of special training the pathologist and allied personnel would need and the time they would consume in reading the smear. The 1045 patients studied were divided into three groups. Among the first 1000 patients there were sixty malignant lesions, including forty carcinomata of the cervix, eighteen fundal malignant conditions, and two vaginal carcinomata. In the second group of forty-one patients the diagnosis was equivocal; and in the third group of four patients there were malignancies elsewhere than in the uterus, cervix or vagina. Among the forty carcinomata of the cervix there were thirty-nine positive results from vaginal smears and one false negative result. Fifteen positive results and three false negative results were obtained for the fundal carcinomata. Both vaginal carcinomata yielded positive results. Thus in the total of sixty malignant lesions in the first group there were four false negative results from smears. In the remaining 940 cases in the first group in which the result was negative by tissue examination, there were eleven false positive results from vaginal smears—an error of 1·17%. The total combined error resulting from false positive and false negative results from smears was 1·5%. The forty-one patients in the second group included twenty with definite carcinomata *in situ* and twenty-one with possible or probable carcinomata *in situ*. In thirteen cases in which the definite lesion was cervical, eight instances of one positive result from a smear were recorded. In only cases of probable lesions was a positive result from a smear recorded. One positive result from a smear was obtained among seven patients with definite endometrial carcinoma *in situ* and no positive results from smears among eight patients with probable endometrial carcinoma *in situ*. In the third group positive results from vaginal smears were obtained from four patients with malignant lesions of the Fallopian tube, bladder, urethra and vulva. Each of the four examiners was previously skilled in tissue diagnosis and, having studied the available literature, spent two weeks in intensive tutelage from a trained vaginal cytologist. It was roughly estimated that the average smear required fifteen to twenty minutes for diagnosis and a difficult smear up to two hours. The authors conclude that the method is highly accurate and that a vaginal smear department of a pathology laboratory could be developed in one year. The method proved valuable in the study of early carcinoma and carcinoma *in situ*, as well as in the diagnosis of more advanced lesions.

Cervical Cancer in Young Girls.

HAROLD SPEERT (*American Journal of Obstetrics and Gynecology*, December, 1947) states that carcinoma of the *cervix uteri* in young girls differs from the disease in adult women in three respects: (i) its apparently worse prognosis, (ii) the preponderance of adenocarcinoma over the epidermoid type, and (iii) its extreme rarity. Only four five-year survivals are recorded among patients under twenty-one years of age, and in this group approximately two-thirds of the lesions are of the glandular type. The author reports two additional cases of carcinoma of the cervix in young girls, one aged twelve years and the other aged nineteen years—the former being the seventh recorded case of this disease in girls aged twelve years or under. The author suggests that the increased number of glandular cancers in this age group may be the result of the lack of hormonic influence on the cervical epithelium—a factor which produces instability at the squamo-columnar junction in adults. The poor prognosis may be the result of inadequate treatment.

The Vaginal Smear Method for the Diagnosis of Uterine Cancer.

LEWIS C. SCHEFFEY, A. E. RAKOFF AND JACOB HOFFMAN (*American Journal of Obstetrics and Gynecology*, March, 1948) report the results of investigations to determine the value of the vaginal smear as a routine procedure for the diagnosis of uterine cancer. A single set of smears was taken from 500 gynæcological patients admitted to wards; the Papanicolaou technique of staining and interpretation was employed. Sixty-three patients had proved uterine cancer, fifty-seven being squamous-cell carcinomata of the cervix, five adenocarcinomata of the body of the uterus, and one a fibrosarcoma of the uterus. For the entire group the vaginal smear method of diagnosis was correct in 94·8% of cases. Correct results were far better for the large group of patients who did not have cancer than for the smaller group in which malignancy was ultimately proved. False positive results only occurred in 1·6% of the 437 patients without cancer, whereas the diagnosis was missed in 30% of the 63 patients who had cancer. The diagnosis of squamous-cell carcinoma of the cervix was missed in 28·8% of proven cases, and in two of the five patients with carcinoma of the *corpus uteri* no evidence was found on vaginal smear examination. The authors state that this method of diagnosis was never meant to replace biopsy of the cervix or diagnostic curettage, but should be used in conjunction with these accepted diagnostic procedures. Smears from the vagina and the cervix are preferable to smears from either source alone and repeated smears have obvious advantages over a single sample. The influence of the personal factor in the interpretation of atypical slides is pointed out. The authors contend that this method of diagnosis has real merit, but that there are definite limitations in its application and usefulness. The necessity for recognizing the limitations of the cytological method is emphasized, since its indiscriminate use may lead to failure to employ more absolute methods of diagnosis or indiscriminate surgery.

RUTH M. GRAHAM, SOMERS H. STURGIS AND JOHN MCGRAW (*American Journal of Obstetrics and Gynecology*, February, 1948) have made a comparative study of the accuracy of standard biopsy and vaginal smear examination in the diagnosis of squamous carcinoma of the cervix. The results are given of the initial vaginal smear examinations and the biopsy reports in 181 cases of proved carcinoma of the cervix. In 82% of patients the results of both the first vaginal smear and the first cervical biopsy were positive for cancer. There were sixteen false negative results from biopsies and fourteen false negative results from vaginal smears; in three patients both methods of diagnosis failed. There was an error in failing to diagnose cancer in 10% of patients by cervical biopsy and an error of 9% by examining the initial vaginal smear. However, there was only an error of 1·7% in initial diagnosis when the results of both methods were combined. This indicates that each method is complementary to the other and one should not be used to the exclusion of the other. The vaginal smear is of special value in those cases in which the cancer is small or hidden from view within the external os. It is in these very cases that the surgeon obtains little indication of likely areas for biopsy. Most of the cases of missed diagnosis by the first vaginal smear are evenly spread over growths of all clinical stages, but in the majority of cases missed by first biopsy the lesions were early and possibly curable. In the 181 cases studied there were sixteen cases of preinvasive carcinoma, and of these a first biopsy failed to make a diagnosis in 50% of cases, but the result of the first smear was positive for cancer in 87% of cases.

A Non-Surgical Method of Therapy for Chronic Endocervicitis.

L. V. DILL (*American Journal of Obstetrics and Gynecology*, December, 1947) describes a method of treatment of non-specific endocervical infection. This lesion is most annoying in its relation to sterility and often is an efficient barrier to pregnancy. Twenty-five patients were treated; 23 were complaining of sterility. All patients

were examined at the ovulatory time to see if there was spontaneous clearing of the cervical mucus at this time. Therapy was begun three days after the onset of a menstrual period and consisted of the administration of one milligramme of stilbœstrol by mouth for fifteen consecutive days; at the same time sulphadiazine, one gramme three times daily, was taken by mouth for three days and then the dosage was reduced to one-half gramme three times daily for seven days. The endocervical mucus was reexamined in the ovulatory phase of the succeeding cycle, and if improvement was appreciable the stilbœstrol was repeated the following month as before with the omission of the sulphadiazine. If there was no improvement, the full course was repeated. Twenty-one of the 25 patients were clinically cured, three were improved, and in one there was no change.

OBSTETRICS.

Anticoagulation Therapy in Thromoembolic Disease.

THE Pitkin menstruum containing gelatin, dextrose, glacial acetic acid and distilled water was developed to regulate the release of water-soluble drugs injected intramuscularly or subcutaneously. By the incorporation of 200 or 300 milligrammes of heparin sodium salt with or without vasoconstrictors a slower and more equable distribution of heparin is obtained. Harry J. Greene and Leo Loewe (*American Journal of Obstetrics and Gynecology*, December, 1947) give their experience in the treatment of 53 gynæcological or obstetrical patients with established thrombo-embolic disease. With patients weighing up to 150 pounds the initial dose is 300 milligrammes of heparin sodium salt; patients over this might receive 400 milligrammes. This dose should be sufficient to keep the patient heparinized for a period of two days. Blood coagulation times are estimated every day to check the effect of the heparin. The method used is the Lee-White modification of Howell's method, as the authors consider the capillary tube technique to be inaccurate. As a general rule, for effective heparinization the blood coagulation time should not be less than two to three times the control coagulation time, that is, thirty to forty-five minutes against nine to fifteen minutes. The results in the series of cases were satisfactory as judged by effective control of pulmonary embolization, marked amelioration of pain and discomfort, rapid recession of œdema, reduction in morbidity, acceleration in convalescence and virtual absence of residual œdema. Eighteen patients in the group of 53 had pulmonary emboli, and of these one died—a case in which the authors consider treatment was insufficient. There were no serious local effects from the injection of the heparin-Pitkin menstruum. The authors stress the importance of the early diagnosis of thrombosis—an unexplained rise in temperature, pulse and respiration of the same reading, an unaccountable feeling of restlessness and disquietude by the patient, aching and pain in the calves of the legs and pain in the chest. The most important sign is direct tenderness in the calf and calf pain on dorsiflexion of the foot. When the precipitating cause of thrombosis is not yet known and the initiating site of the thrombosis can be ascertained in many cases only by vague and indeterminate clinical signs, they consider that the general systemic anticoagulation effect of heparin is a more rational therapeutic weapon than local vein ligation.

Infertility.

IVAN M. PROCTER AND KENNETH DICKINSON (*American Journal of Obstetrics, and Gynecology*, January, 1947) outline a practical approach to the investigation of sterility in the female under four headings: mechanical factors, chemical factors, endocrine factors and general factors. Mechanical causes can be investigated by a general gynæcological examination and tubal insufflation. Endocrine causes, from a practical point of view, can be observed from the history and physical examination of the patient, estimation of the basal metabolic rate, and endometrial biopsy. Among 210 patients studied by the authors 153 had had no previous pregnancies; 49, with secondary sterility, had a bad fertility record resulting in only eleven living children with thirty abortions, five stillborn children and three tubal pregnancies. Of the total series, 59% of patients showed outstanding pathological conditions of the cervix. The authors state that the retroflexed uterus may present a mechanical factor in sterility in that the cervix may become lifted out of the seminal pool. Abnormalities of the male were causal factors in 50% of cases in the series. Tubal insufflation by Rubin's method is stated to be both diagnostic and therapeutic and to be indispensable in the investigation of female sterility. Of the patients investigated 61% showed endocrine disturbance, chiefly in the direction of obesity, this indicating a group which responds favourably to thyreoid. Sixty-one patients received thyreoid extract, and of these 36 became pregnant. The authors are convinced that thyreoid is the outstanding agent in the treatment of female sterility. Of the 210 patients 35% conceived after treatment and the results were: 53 normal babies, nine miscarriages and one tubal pregnancy. According to the authors the longer a woman accepts her infertility without treatment the less successful is treatment. One in every four women who have treatment for sterility along these lines will succeed in having a normal viable child.

Sterility in the Female.

KENNETH M. GRANT (*American Journal of Obstetrics and Gynecology*, March, 1948) discusses the types and causes of female sterility and details a scheme for the thorough investigation of a patient with sterility in three visits over a total period of six months. The causative factors most commonly encountered in his patients were, in order of frequency, cervical erosions and infections, mild degrees of cervical stenosis, hypothyreoidism, tubal occlusion, and impaired quality of spermatozoa. At the first visit a complete medical and gynæcological history is taken, a thorough physical and pelvic examination is made, the cervical canal is probed, and the patient is instructed as to the taking of vaginal or rectal temperatures. In pelvic examination special attention is paid to infection of the lower genital tract, structural abnormalities, malposition of the uterus or adnexa, and evidence of pelvic inflammatory disease or endometriosis. If pelvic examination under anæsthesia is indicated, the time of choice is just before the onset of the menstrual period when endometrial biopsy will give information concerning ovulation. The husband's history is taken and examination made separately, and arrangements are made for a sperm analysis before the second visit. Blood serology is investigated for both partners. On the second visit, if clinical findings and laboratory reports are satisfactory, a basal metabolic test and tubal insufflation and/or preparation of a uterotubogram are carried out. If the tubes are patent the patient is instructed to come on the next visit prepared for a Huhner's post-coital test. On the third visit examination is made of the semen from the vaginal pool and the cervix within one to two hours after coitus at the expected time of ovulation. When an abnormality is present in the male he should be referred to a competent urologist for investigation and treatment. The author tends to use endometrial biopsy less, and basal body temperature curves more. A pronounced biphasic curve is regarded as evidence that ovulation has occurred. Hypothyreoidism is the commonest endocrine factor in the ætiology of sterility, and mild degrees of this condition are often associated with sterility. Except in cases of true genital hypoplasia and the occasional case of menstrual irregularity not corrected by thyreoid therapy, female sex hormones are rarely used. The author considers that much time and energy has been wasted in the indiscriminate use of sex hormone therapy in cases of sterility and that sometimes the effects have been harmful.

Prolapse of the Vaginal Vault following Hysterectomy.

HENRY N. SHAW (*The Western Journal of Surgery, Obstetrics and Gynecology*, March, 1948) describes a new method of repair of vaginal vault prolapse following hysterectomy performed on three patients. Vault prolapse may occur after subtotal or total hysterectomy. When the condition occurs within a few months of operation it is usually thought that the supporting structures of the vault have not been properly attached. When the prolapse develops some years after hysterectomy there has usually been an associated unrepaired cystocele or rectocele due to a progressive increase of the prolapse. Other measures used are mentioned, such as suturing the vault to the rectus sheath and suspension of the vault to the presacral fascia in the region of the utero-sacral ligaments. The use of ox fascia for reconstructing the round ligaments and the extensive use of fascial slings in supporting vaginal tissue in repair operations for urinary incontinence prompted the author to try the use of fascial strips from the rectus sheath to repair vault prolapse. The technique of the operation is described and illustrated and consists essentially of throwing down a fascial strip of the rectus sheath on each side of the midline and passing these retroperitoneally along the course of the round ligament and suturing them to the vault or the residual cervix in the midline. The repair of any cystocele and/or rectocele completes the operation.

British Medical Association News.

SCIENTIFIC.

A MEETING of the Victorian Branch of the British Medical Association was held on July 17, 1948, at the West Gippsland Hospital, Warragul, MAJOR-GENERAL F. KINGSLEY NORRIS, C.B.E., D.S.O., the President, in the chair. The afternoon session took the form of a series of clinical demonstrations by members of the Gippsland Subdivision. At the evening session DR. W. F. FERGUSON (Trafalgar) introduced a discussion on "Clinical Aspects of Leuchæmia".

Tuberculous Abscess of the Mediastinum.

DR. H. V. PEAKE (Warragul) showed a male patient, aged forty-two years, with acknowledgement to DR. J. T. HAYWARD, thoracic surgeon at the Royal Melbourne Hospital. At seven years, and again at fourteen years of age, the patient had suffered from pneumonia, and at twenty-six years he had had pleurisy. On his admission to the Royal Melbourne Hospital on May 22, 1948, he gave a history extending over twenty months of swelling over the anterior part of the left side of the chest. He had had no cough or sputum or hæmoptysis, but he had had pain in the chest and malaise whenever the lump increased in size. The original swelling had not altered materially for the first twelve months, but it had then become larger, and several other lumps had appeared. Three sinuses were present over the left of the sternum, one at the level of the sterno-clavicular joint and the others at the levels of the second and the fourth costal cartilages respectively. The skin between the two upper sinuses was swollen and cyanotic, but not fluctuant. On May 24 Dr. Hayward had excised the sinuses under general anæsthesia and had supplied the following report of the operation:

> An incision was made along the length of the sternum joining the sinus openings at the level of the second and fourth costal cartilages. This was later extended upwards to include the upper sinus. On further probing it was found that the sinuses passed laterally and communicated through a large space under the pectoral muscles as far as about three inches to the left of the parasternal line. The bone or costal cartilages at this position did not seem to be diseased. However, the upper sinuses were found to pass deeply into the neck, and two sinuses, one superior and one inferior to the level of the sterno-clavicular joint, were found to communicate behind it. The sterno-clavicular joint seemed to be intact, but it is possible that the tuberculous process had also involved it. The first costal cartilage was removed to facilitate access to the diseased bone. The upper end of the sternum was cut right across, but the sterno-clavicular joint was left intact. With a Volkmann's spoon, all these sinuses and spaces were curetted out and a considerable amount of tuberculous caseous material was obtained. A glove drain was put into the space under the pectoral muscle and the skin was sutured with interrupted silk-worm gut from above the *manubrium sterni* to the level of the fourth costal cartilage. The sinus to the left of this line was excised and not sutured.

The report received by Dr. Peake also contained the information that a hæmatoma had formed under the pectoral muscle, but by June 3 it had subsided and the sutures were removed; and on June 11 streptomycin treatment was stopped and the patient was able to sit out of bed. From skiagrams prepared on June 16, it was apparent that some fairly well-defined tuberculous nodules were scattered about in the right sub-apical area and also a few in the left sub-apical region with thickened trunks and a little calcification.

Dr. Peake said that the cold abscess had presumably arisen from a tuberculous gland in the course of the left internal mammary artery, and that, since his discharge from hospital on June 19, the patient had gained in weight and strength.

DR. T. D. HAGGER (Melbourne) said that it was likely that there had been a spreading of organisms through the blood stream, and it was doubtful whether streptomycin would cure the patient.

DR. LEONARD BALL (Melbourne) said that he presumed that a focus was left in the first costal cartilage, which was not an uncommon site. He thought it was desirable that the whole of the tissues affected in the neighbourhood of the abscess should be removed surgically.

DR. E. HUGHES-JONES (Melbourne) commented that he agreed with what Dr. Ball had said; the patient could not be regarded as cured and would probably develop another cold abscess. At another time he (Dr. Hughes-Jones) had discussed the site of the original focus in those cases with Dr. Alan Penington, who maintained that it was more frequently in a mediastinal gland than in a costal cartilage.

DR. LESLIE HURLEY (Melbourne) recalled having seen two patients with cold abscess presenting in the front of the chest, and observed that the tuberculous process could go on for a long time without evidence of constitutional disturbance.

DR. G. A. PENINGTON (Melbourne) said that the condition arose primarily from the lymphadenoid tissue in the mediastinal glands. He advised that streptomycin should be used locally, as it was likely to be effective in controlling activity; aspiration should precede introduction of the streptomycin. In reply to a question from Dr. B. L. Deans (Warragul), Dr. Penington said that, in hyperplasia of lymphoid tissue, deep irradiation therapy was useful, but it could not affect tuberculous tissue, though temporarily it might be helpful.

DR. ROBERT SOUTHBY (Melbourne) said that a similar complication had appeared in a young woman some fourteen months after the completion of sanatorium treatment for pulmonary tuberculosis.

DR. IAN MCLEAN (Melbourne) referred to the treatment of a supposed lymphosarcoma of the anterior mediastinum in a soldier by deep irradiation; the therapy seemed to make the condition worse, as a large swelling presented on the neck, and physical signs appeared in the lungs. It was thought that the lymphosarcoma had become disseminated; but Dr. Edgar King had reported the presence of tuberculous changes in a gland near the lesion removed for biopsy examination.

DR. MICHAEL KELLY (Melbourne) said that in a similar case he had removed the costal cartilage, which he thought was affected, but further trouble arose. He had applied deep irradiation and the lesion healed quickly.

DR. JOHN MULLANY (Melbourne) said that streptomycin should be used intramuscularly as well as locally; by its use in those ways he had been able to heal a cold abscess after careful aspiration of the contents.

Eale's Disease.

DR. B. L. DEANS (Warragul), with acknowledgement to DR. LEONARD MITCHELL (Melbourne), showed a male patient, aged nineteen years, who had had recurrent vitreous hæmorrhages. Five months before the meeting the youth had hit his face on the water when diving, and had felt a sharp pain in the left eye and been temporarily blinded. A month later he had had a recurrence after stacking wood. Each time a floating curtain of blood was seen in the vitreous by the examining doctor. Dr. Deans reported that the family history contained no references to the occurrence of disorders of the blood or tuberculous conditions. The patient's blood had been examined, but all the findings obtained were within the normal range. The skiagrams of the lungs were also considered to be free of abnormalities. Mantoux testing was in progress and a course of tuberculin injections was contemplated.

DR. F. L. DAVIES (Melbourne) said that the ætiology of vitreous hæmorrhages was indefinite and that the hæmorrhage ranged in severity from minute specks of floating clot to the filling of the vitreous chamber with blood. When the fundus was occluded the vision returned dimly as the clot was absorbed. The prognosis was also indefinite, but improvement was the rule; either the subject became accustomed to the cloudiness or vision improved as the blood was absorbed; but Dr. Davies doubted whether the vitreous ever cleared completely.

DR. KELVIN LIDGETT (Melbourne) said that he agreed with what Dr. Davies had said; the hæmorrhage was from the retina, the vitreous itself being avascular. Eale's disease was a primary hæmorrhagic retinitis of unknown origin. It affected adolescents, males more often than females, and the left eye was involved more often than the right. In many instances the patient was tuberculous, and indeed tubercle bacilli had been identified from the close neighbourhood of the lesion. Septic foci were prone to play a part, and in two examples an association with Buerger's disease had been recorded. Anticoagulant therapy was also advised. Dr. Lidgett went on to say that the story usually started with a sudden onset, and with blurring of vision rather than blindness, as the macula might be spared; more often than not the other eye was affected sooner or later. *Retinitis proliferans* with detachment occurred at times.

and secondary glaucoma was another complication. Irradiation therapy had been employed to occlude small bleeding points, but it was advisable to use a shield to protect the lens from keratitis.

DR. R. L. NAYLOR (Melbourne) said that he knew of three soldiers who had been discharged by medical boards on account of Eale's disease. A congenital weakness in the retinal vessels must underlie the condition, which was somewhat analogous to retinal detachment. The subjects were unfit for military service because of the liability to recurrences.

Carcinoma of the Larynx.

Dr. Deans also showed a male patient, aged fifty years, suffering from squamous-celled carcinoma of the larynx which had been treated by laryngo-fissure by Dr. George Swinburne. When the patient was first examined, he gave a history of six months of huskiness and "laryngitis". From skiagrams of the chest it appeared that there was an enlargement of the ascending part of the aorta, raising the suspicion that an aneurysm was present; but the possibility was excluded after inspection of oblique films and after the failure to obtain the Wassermann reaction. By laryngoscopy, a flat, wart-like excrescence was seen on the right vocal cord near its posterior end. No regional lymph glands were palpable. A specimen was obtained, and from the biopsy preparations it was ascertained that the condition was a well-keratinized squamous epithelioma. The high degree of cell differentiation was regarded by the pathologist as indicative of a fairly good prognosis. Preparations from the anterior end of the cord were also examined, but no evidence of neoplastic activity was found in them. Dr. Deans said that Dr. Swinburne had performed laryngofissure six months before the meeting, and that the patient had remained in good health since the operation; a false cord had formed and the unaffected cord moved in normal fashion, but the voice was faint. Dr. Deans added that he had shown the patient at the meeting, knowing that Dr. Swinburne would be present to supply additional information and comments.

DR. GEORGE SWINBURNE (Melbourne) said that the position of the lesion was more posterior than usual, and that the movement of the cord was good. Fibrosis followed the operation in three to six months and usually caused the subject to have a good husky voice; but the present patient had less fibrosis, as the site had epithelialized quickly and cleanly. As a raw patch was still present, further fibrosis might make the voice better. It was questionable whether a penicillin cover should be used for the operation, as the fibrous thickening was thus minimized. As Dr. Deans had reported, sections from each side had been examined and the post-operative preparations were clear and satisfactory, so there was no need for irradiation or removal of the other cord.

In conclusion, Dr. Swinburne said that, though the patient had been well for six months, it was necessary to wait five years before he could be considered safe. The site was a favourable one at which to treat an epithelioma, as there was no glandular spread.

Dr. F. L. Davies mentioned the interesting nature of several books concerned with Sir Morell Mackenzie and Kaiser Wilhelm's laryngeal disorder.

Bronchiectasis.

Dr. Deans finally showed a girl, aged nine years, suffering from bronchiectasis, which appeared to be limited to a collapsed portion of the lower lobe of the left lung. He expressed his gratitude to Dr. T. D. Hagger and to Dr. Gwynne Villiers, who had prepared the bronchograms. Dr. Deans said that the child had had a cough from the age of three years, and that there was no recollection of any particular precipitating illness. Well-developed changes indicative of cylindrical bronchiectasis were present in the collapsed lower lobe of the left lung, in the lingula and in the upper lobe, and the bronchi of the remainder of the lungs apeared to be unaffected; but Dr. Villiers had encountered technical difficulties and was not completely satisfied with the bronchograms. A moderate degree of mucosal thickening was seen in the films of the sinuses. Dr. Deans added that he was showing the patient because her condition had improved considerably with postural drainage; she had gained in weight and looked normally healthy, but she still had the cough and a little expectoration. If lobectomy was advised, it was difficult in practice to convince the parents of such a child that so formidable an operation was essential.

DR. G. A. PENINGTON said that it was important to have all the peribronchial segments visualized. It was necessary to find out more about the patient's left lung. Extensive bronchiectasis with some collapse was present in the lower lobe of the left lung; to achieve drainage the child had to be tilted into a difficult position. The circumstances were most favourable for lobectomy; without operation, the pathological condition would progress and the other side would become affected.

Dr. Penington went on to say that sinus infection had an insignificant influence on bronchiectasis; the bronchi most likely to receive the mucopurulent secretions were those least likely to become bronchiectatic.

DR. T. D. HAGGER (Melbourne) said that Dr. Villiers had had great trouble with the bronchogram, and that the material improvement in the child's health and condition had resulted in putting the parents off the operation.

DR. L. P. WAIT (Melbourne) emphasized the importance of clinical signs in bronchiectasis. He said that they should take precedence over radiological impressions. He also referred to the desirability of performing bronchoscopic inspection and toilet carefully before the lipiodol was instilled; only thus could visualization of all parts of the bronchial system be completed. On the evidence he thought that the child should be given the benefit of operation, but no rash promises should be made as to prognosis; the results of lobectomy were not yet convincing.

DR. JOHN COLEBATCH (Melbourne) spoke of the difficulty in obtaining good bronchograms, and said that the results were improved by bronchoscopy. He thought that the operative treatment was the best that could be offered, combined with sound dietary and hygienic management; it was especially important to avoid protein deficiency for the reduction of the infective factor.

DR. ROBERT SOUTHBY (Melbourne) doubted whether the patient should be a candidate for operation. He quoted the cases of two such girls who had extensive bilateral bronchiectasis; he had sent them to the country for a couple of years and they had derived great benefit. Dr. Southby also expressed the opinion that sinusitis and bronchiectasis were associated to a greater extent than Dr. Penington had indicated; he had seen definite improvement when the sinus trouble had been cleared up.

Dr. Penington spoke again. He said that, as lobectomy was a major operation, they should go further into the investigation of the cases before it was performed. The bronchograms were good; the collapse of the lower lobe with fibrosis would increase the surgical difficulties. He made it clear that, while recognizing that sinusitis was important in respiratory infections, he did not believe it to be a cause of bronchiectasis; the sinusitis should receive attention before operation.

DR. LESLIE HURLEY (Melbourne) said that he had yet to see established bronchiectasis cured by attention to the sinuses, nor did chronic sinusitis often precede bronchiectasis; yet most subjects of established bronchiectasis had sinusitis also.

Major-General Norris, from the chair, observed that there was an association between infections of the upper and of the lower portions of the respiratory tract. Lobectomy was not a simple procedure, but it was a successful one.

The Eisenmenger Complex.

DR. M. MARTIN (Garfield) showed a girl, aged ten years, who was lying in bed cyanosed and distressed, suffering from the consequences of a series of congenital heart anomalies. Dr. Martin said that the differential diagnosis was of considerable interest and that approximately three weeks before the meeting the girl had had an acute incident, the nature of which was also suitable for discussion. The child was the second in a family of four. Her older brother was known to have incomplete ossification of the skull, but in other respects there was nothing of interest in the family history. Shortly after the girl's birth the parents were told that there was something wrong with her heart; but they had not noticed any symptoms until, at the age of two years, she became cyanosed and dyspnœic whenever she attempted to walk. Dr. Martin said that he had attended her first at the age of eight years for scarlet fever. He was informed that until she was six years old she had been subject to "blackouts" and occasional colds, but no other illnesses had occurred and the physical development was satisfactory. She had commenced to attend school at the age of six years, and was regarded as smart from the scholastic point of view. Latterly the parents had noticed the increasing prevalence of an unproductive cough, but she had never had a hæmorrhage. She avoided exertion and did not play with other children; after mild movement she rested on a couch or bed or assumed a squatting

position until she recovered from the effects. The immediate cause for her admission at the West Gippsland Hospital was the acute incident to which Dr. Martin had referred. On June 22, 1948, while standing near the blackboard, the girl had collapsed suddenly and remained unconscious for more than an hour. She was promptly brought to hospital and attended by Dr. Baldwyn, who administered one-eighth of a grain of morphine and instituted resuscitation treatment pending the arrival of Dr. Martin. Dr. Martin said that he found her, a few hours later, in a condition of shock, with a subnormal temperature, clammy skin, weak heart sounds, imperceptible radial pulse and blood pressure too low to register. On the following day the systolic pressure was 90 millimetres of mercury, she was still very exhausted and the radial pulse was barely perceptible. At the time of the meeting she was not fit to be out of bed, but was less cyanotic than she had been at any time since the occurrence of the incident.

Dr. Martin went on to say that he wished to discuss the main diagnosis first and that of the incident afterwards. He had prepared a diagram to illustrate the classical arrangement which underlay Fallot's tetralogy in order to facilitate his description of the findings and of his views on the diagnosis in the girl's case; but her condition was not characteristic of the tetralogy. The child was thin, but well developed, lying comfortably in bed, somewhat cyanosed, but not dyspnœic when at rest. The pulse was regular, but the rate was fixed at 48 per minute. The respirations numbered 20 per minute. The blood pressure was 110 millimetres of mercury, systolic, and 90 millimetres, diastolic. The chest was symmetrical and well formed, but there was a prominent network of venules over the chest and abdomen. Posteriorly the cyanosis was dusky. Though the vesicular breathing was harsh, no adventitious sounds were heard. Over the precordium, the apex beat was diffuse and was placed approximately four inches from the left sternal border in the fifth intercostal space, and there was some right cardiac dulness indicative of the presence of a large heart. Pulsations were visible in the epigastrium and along the course of the jugular veins, but there was no thrill over the heart or dulness in the second intercostal space on either side of the sternum. At the apex, the first heart sound was muffled and the intensity varied from spot to spot; in the pulmonary area the second sound was reinforced; in the second intercostal space, just to the right of the sternum, a faint systolic murmur could be heard best, radiating towards the right subclavicular region, to the left of the sternum and to the interscapular region. The rate was 48 per minute. The liver and spleen did not appear to be enlarged, but cyanosis and clubbing of the fingers and toes were present, the knee jerks were sluggish and the plantar and pupillary reflexes were normal. The urine was not abnormal, but the blood was grossly concentrated. The red blood cells numbered 8,740,000 per cubic millimetre and the white cells 12,600 per cubic millimetre; the hæmoglobin value was estimated at 160% (22·4 grammes *per centum*) and the colour index was 0·92.

In discussing the diagnosis, Dr. Martin started with the statement that the statistical evidence supported the belief that Fallot's tetralogy was present in a majority of patients with persistent and intensive cyanosis who survived infancy. He then demonstrated from the diagram the effect on the blood flow of the mixed lesion consisting of pulmonary stenosis, dilatation and hypertrophy of the right ventricle, deficiency in the interventricular septum and dextroposition of the aorta. With each systole, blood from the right ventricle was forced into the left ventricle, into the aorta overriding the septal defect, and to a much smaller extent into the pulmonary circulation. The main clinical features were: (*a*) cyanosis, clubbing of the digits and polycythæmia; (*b*) dyspnœa on slight exertion; (*c*) a loud systolic murmur maximal in the pulmonary area, usually accompanied by a thrill and reduction in the intensity of the second pulmonary heart sound; (*d*) right axis deviation, high *P* waves, high *QRS* voltage, and, frequently, inversion of the *T* waves in Leads II and III, and the presence of heart block, intraventricular or auriculo-ventricular; (*e*) radiological signs of what was known as the boot-shaped heart and absence of the pulmonary conus outline. Dr. Martin then referred to the features of the case under discussion; he said that (*a*) and (*b*) were present, but (*d*) and (*e*) were lacking. Commenting on (*d*), he said that two electrocardiographic examinations had been made after the recent acute incident. Complete heart block was established, the ventricular rate being 48 and the auricular rate 100 per minute. Right ventricular preponderance of an unusually high degree was present, and the *P* waves were high. Commenting on (*c*), Dr. Martin said that in place of the loud systolic bruit, the thrill and the absent, weak or normal second pulmonary heart sound, a softer murmur and a reinforced second pulmonary sound were present. It was therefore doubtful whether the patient was suffering from pulmonary stenosis. Commenting on (*e*), he said that the skiagraphic evidence was sufficient to enable him to rule out the possibility of the presence of a hypoplastic, stenotic pulmonary artery. Dr. B. L. Deans had made a radiological examination.

In the postero-anterior film, the heart outline was globular and the transverse diameter was enlarged, mainly to the left of the mid-line. The aorta was hypoplastic, the aortic knuckle being almost absent; the arch lay to the left of the mid-line. With regard to the left border of the heart, prominence was observed in the region of the pulmonary conus; this was thought to indicate either that that structure or the appendage of the left auricle was well developed. The right aortic outline after a barium bolus showed a normal œsophageal impression with a slightly pronounced aortic notch, no tracheal notch and no sign of left auricular hypertrophy. The prominence in the region of the pulmonary conus in the postero-anterior film was therefore due, not to the left auricular appendage, but to a well-developed pulmonary conus. No characteristic appearance was seen in the left aortic outline. In the lung fields a pronounced broncho-vascular pattern was present, consistent with considerable pulmonary congestion. Discussing the differential diagnosis, Dr. Martin said that at least four other clinical pictures included cyanosis of some degree associated with cardiac anomaly: (i) pulmonary arteriovenous shunt, (ii) transposition of the great cardiac vessels, (iii) uncomplicated deficiency of the interventricular septum, (iv) the Eisenmenger complex. He was satisfied that (i) and (ii) could be dismissed from further consideration, because of the presence of heart disease and on the skiagraphic and radioscopic evidence. He also thought that (iii) was improbable. To explain the clubbing of the digits, it would be necessary to postulate almost complete absence of the septum which usually led to death in infancy; moreover, apart from the high voltage of the ventricular complex, the electrocardiograms were normal, and right axis deviation was found only occasionally and usually only as a terminal phase. There remained the fourth clinical picture, the uncommon Eisenmenger complex, which differed from Fallot's tetralogy in that pulmonary stenosis was absent; the large pulmonary conus, the congested lung fields and the hypoplastic aorta made that diagnosis probable. Finally, Dr. Martin commented on the acute incident previously described. He thought it probable that the girl had had a syncopal attack, which was commonly encountered in cases of the kind; but it was still necessary to explain why she continued to be in a state of shock and exhaustion for several days. In the electrocardiogram obtained on June 24, 1948, the take-off in Lead I was high, the *S-T* segment was bowed down, a mirror image was present in Lead III and the *T* waves were flat or inverted. In the second set of tracings prepared three weeks afterwards the *S-T* segment was more nearly normal. The temporary nature of the abnormal appearances was suggestive of the occurrence of myocardial infarction, which could have been caused by acute coronary insufficiency during the syncopal attack; the sudden lowering of blood pressure and reduction of cardiac output would lead to the diminution of the blood flow in the coronary vessels.

DR. H. BOYD GRAHAM (Melbourne) said that he had been interested in Dr. Martin's exposition of the case. His colleagues at the Children's Hospital, Melbourne, would recall with him an unusual heart, recently inspected at a meeting, which had belonged to a patient admitted to the hospital with a clinical condition not unlike that of Dr. Martin's patient. The patient at the Children's Hospital was aged twelve years and had always been cyanosed and dyspnœic; but for twenty-four hours she had been extremely distressed, and had an icteric tinge and was drowsy and barely conscious. She had heart block, feeble pulse, low blood pressure, considerable enlargement of the liver, oliguria with albuminuria, and polycythæmia. Frequent paroxysms of pain over the liver of short duration occurred, and in a lucid interval the child had informed Dr. Graham that the pains had been occurring every minute or so throughout the previous night. The child died next day from congestive heart failure. The heart was huge, but it varied from the characteristic heart of Fallot's tetralogy in several ways. The great vessels arose as a common trunk from above a large opening towards the top of the interventricular septum, and a close inspection was necessary to discover that the pulmonary artery arose from the wall of the aorta; no surgeon could have devised a way of shunting blood from the aorta to the pulmonary artery, for the shunt was operating naturally in the anomalous

arrangement. The famous tetralogy and the Eisenmenger complex should be regarded as variants that had been more particularly described, but doubtless there were many other variants. It was possible that, in Dr. Martin's patient, the arrangement resembled that in the patient Dr. Graham had quoted, but that the pulmonary artery had a wider orifice in the aortic wall, which abolished the features of stenosis. Nevertheless, the criteria essential to the successful performance of a surgical operation to shunt blood to the pulmonary circulation were not present. In such a case it was inadvisable to raise the hopes of the parents, and the probability was that a time would soon come when for some reason or other the patient would succumb to vegetative bacterial endocarditis or congestive heart failure.

DR. ROBERT SOUTHBY (Melbourne) said that he had thought it possible that the child was epileptic from the description Dr. Martin had given of the "blackouts" in early life and the recent acute incident. He had been surprised to hear that an injection of morphine had been given at the hospital, as morphine was not good for children, especially when they were cyanosed and depressed. He, too, felt that the prognosis was poor.

DR. JOHN COLEBATCH (Melbourne) said that, though about three out of four "blue babies" conformed to the features of Fallot's tetralogy, he agreed with Dr. Boyd Graham that there were many variants of the anomaly. He felt sure that the child had recently had an attack of coronary occlusion from which she appeared to have recovered. He had come across no less than three articles dealing with the occurrence of coronary occlusion in infancy or childhood, and had been impressed with the great capacity in early life for the development of efficient collateral circulation in the heart muscles.

DR. G. A. PENINGTON (Melbourne), after close examination of the electrocardiograms, said that the two sets showed the same variations. He mentioned the high take-off in Lead I and the low take-off in Lead III and also the inversion of *T* waves and the low *T* wave in Lead IV. He referred to the difficulty in dealing with cardiac infarction in such a case, and remarked that the complete heart block also adversely affected the prognosis.

Major-General Norris, from the chair, congratulated Dr. Martin on the excellence of his contribution to the meeting. Major-General Norris said that he considered that, as without surgery the prognosis was hopeless, the possible benefits of surgical intervention should be seriously explored. He wondered what the expert would decide to do if the patient was his own child; that was the right approach—could the surgeon help her to have a more active life, even for a little while? He wondered whether an aortic-pulmonary shunt operation would help her. Dr. Martin should ask Dr. C. J. O. Brown whether he could do something which might be helpful to her. To see a "blue baby" walking in two weeks and running in three weeks after the operation was dramatic; the child would be happy then, but otherwise her future was blank.

(To be continued.)

NEW SOUTH WALES BRANCH NEWS.

THE following books, pamphlets and journals have been added to the library of the New South Wales Branch during the period February 1 to July 22, 1948.

Abt, I. A., and Abt, A. F., edited by: "The 1947 Yearbook of Pediatrics."
Bamford, Frank: "Poisons", Second Edition, 1947.
Benda, C. E.: "Mongolism and Cretinism", 1947.
Berg, C.: "Deep Analysis", 1946.
Bethea, Oscar W., edited by: "The 1947 Yearbook of General Therapeutics."
Binger, C.: "The Doctor's Job", 1946.
Bothman, L., and others, edited by: "The 1947 Yearbook of Eye, Ear, Nose and Throat."
Boyd, W.: "Surgical Pathology", Sixth Edition, 1947.
Boyd, W.: "Textbook of Pathology", Fifth Edition, 1947.
Braun-Menendenz, Eduardo, and others: "Renal Hypertension", translated by Lewis Dexter, 1946.
Brown, Keith Macarthur: "Happiness and Health in Womanhood", Third Edition, 1948.
Carling, Sir Ernest Rock, and Ross, J. Paterson: "British Surgical Practice", Volume II, 1948.
Clark-Kennedy, A. E.: "Medicine", Volume I, 1947.
Clendening, L., and Hashinger, E. H.: "Methods of Diagnosis", 1947.
Commonwealth of Australia, Department of Health, Service Publication Number 6: "Spiders, Ticks and Mites", by the late F. H. Taylor and R. E. Murray, 1946.
Compere, Edward L., edited by: "The 1947 Yearbook of Orthopedics and Traumatic Surgery."
Crew, F. A. E.: "Genetics in Relation to Clinical Medicine", 1947.
Cyriax, J.: "Rheumatism and Soft Tissue Injuries", 1947.
Daley, Raymond, and Miller, Henry G., edited by: "Progress in Clinical Medicine", 1948.
Dameshek, W., edited by: "Morphologic Hematology", 1947.
Dick, George F., and others, edited by: "The 1947 Yearbook of General Medicine."
Edwards, H. C.: "Recent Advances in Surgery", Third Edition, 1948.
Ewen, J. H.: "Mental Health", 1947.
FitzWilliams, D. C. L.: "Cancer of the Breast", 1947.
Gesell, A., and Amatruda, C. S.: "Developmental Diagnosis (Normal and Abnormal Child Development)", Second Edition, 1947.
Greenhill, J. P.: "The 1947 Yearbook of Obstetrics and Gynecology."
Gibbons, J.: "The Care of Young Babies", Second Edition, 1946.
Gill, G. H.: "Dust and its Effect on the Respiratory System", 1947.
Graham, E. A., edited by: "The 1947 Yearbook of General Surgery."
Great Britain—General Register Office: "Studies on Medical and Population Subjects": Number 1: "Regional and Local Differences in Cancer Death Rates", by Percy Stocks, 1947.
Great Britain—Medical Research Council. Special Reports: Number 260, "The Bacteriology of Spray-Dried Egg with Particular Reference to Food Poisoning", by various authors, 1947. Number 261, "Hearing Aids and Audiometers", Report of the Committee on Electro-Acoustics, 1947.
Hale-White, William: "Materia Medica, Pharmacy, Pharmacology and Therapeutics", revised by A. H. Douthwaite, Twenty-Seventh Edition, 1947.
Hall, I. Simson: "Diseases of the Nose, Throat and Ear", Fourth Edition, 1947.
Harrison, G. A.: "Chemical Methods in Clinical Medicine" Third Edition, 1947.
Harrower, M. R., edited by: "Training in Clinical Psychology", 1947.
Havinga, E., and others: "Modern Development of Chemotherapy", 1946.
Hern, K. M.: "Physical Treatment of Injuries of the Brain and Allied Nervous Disorders", 1947.
Hewer, E. E.: "A Textbook of Histology for Medical Students", Fourth Edition, 1947.
Hill, Ernestine: "Flying Doctor Calling: The Flying Doctor Service of Australia", 1947.
Hill, H., and Dodsworth, E.: "Food Inspection Notes", Second Edition, 1947.
Holmes and Ruggles' "Roentgen Interpretation", by G. W. Holmes and L. L. Robbins, Seventh Edition, 1947.
Jamieson, E. B.: "Illustrations of Regional Anatomy" (seven volumes), Seventh Edition, 1947.
Jellinek, S.: "Dying, Apparent Death and Resuscitation", 1947.
Jersild, A. T.: "Child Psychology", Third Edition, 1947.
Kovács, Richard, edited by: "The 1947 Yearbook of Physical Medicine."
Kuntz, Albert: "The Autonomic Nervous System", Third Edition, 1946.
Lickley, J. D.: "An Introduction to Gastroenterology", 1947.
Lowsley, Oswald S., edited by: "The 1947 Yearbook of Urology."
Matthews, Squadron Leader D. N., R.A.F.V.R.: "The Surgery of Repair, Injuries and Burns", 1943.
Meering, A. B.: "A Handbook for Nursery Nurses", 1947.
Melbourne University Calendar for 1948.
Moodie, William: "The Doctor and the Difficult Adult", 1947.
MacEachern, Malcolm T.: "Hospital Organization and Management", Second Edition, 1947.
National Institute of Health, Bulletin Number 189: "Studies on Schistosomiasis", by various authors, 1947.
Novak, E.: "Gynecological and Obstetrical Pathology", Second Edition, 1947.
Percival, G. H. (formerly by Norman Walker): "An Introduction to Dermatology", Eleventh Edition, 1947.
Price, Frederick W., edited by: "A Textbook of the Practice of Medicine", by various authors, Seventh Edition, 1946.
Reese, Hans H., and others, edited by: "The 1947 Yearbook of Neurology, Psychiatry and Neurosurgery."
Runes, D. D., edited by: "The Selected Writings of Benjamin Rush", 1947.
Senn, M. J. E., edited by: "Problems of Early Infancy", 1947.
Stallard, H. B.: "Eye Surgery", 1946.

Standing Committee on Laboratory Methods, University of Glasgow: "Notes on Clinical Laboratory Methods", Fifth Edition, 1947.
Sulzberger, Marion B., and Baer, Rudolf L., edited by: "The 1947 Yearbook of Dermatology and Syphilology."
Supplement to Catalogue of Lewis' Medical, Scientific and Technical Lending Library (1944-1946).
Thompson, W. O., and others: "The 1946 Yearbook of Endocrinology, Metabolism and Nutrition."
Thompson, W. O., and Spies, T. D., edited by: "The 1947 Yearbook of Endocrinology, Metabolism and Nutrition."
Trueta, J.: "Principles and Practice of War Surgery", Third Edition, 1946.
Trueta, J., and others: "Studies of the Renal Circulation", 1947.
Vischer, A. L.: "Old Age", 1947.
Wakeley, C. P. G.: "Hey Groves' Synopsis of Surgery", Thirteenth Edition, 1947.
Wakeley, Sir Cecil, edited by: "Modern Treatment Yearbook", 1947.
Waterlow, J. C.: "Fatty Liver Disease in Infants in the British West Indies", 1948 (Great Britain. Medical Research Council, Special Report Number 263).
Waters, Charles A., and others, edited by: "The 1947 Yearbook of Radiology."
Wharton, L. R.: "Gynecology with a Section on Female Urology", Second Edition, 1947.
Wiener, K.: "Skin Manifestations of Internal Disorders", 1947.
Williams, Trevor Illytd: "Drugs from Plants", 1947.
Williamson, B.: "A Handbook on the Diseases of Children", Fifth Edition, 1947.

Journals.

Adelaide Children's Hospital Clinical Reports (from Volume I, 1947), *Annals of Eugenics* (from Volume XIII, 1946), *Annals of the Royal College of Surgeons of England* (from Volume I, 1947), *Annotated Bibliography of Medical Mycology* (from 1944), *British Journal of Cancer* (from Volume I, 1947), *Digest of Neurology and Psychiatry* (from Series Number 15, 1947), *Gastroenterology* (from Volume IX, 1947), *Journal of Clinical Pathology* (from Volume I, 1947), *Obstetrical and Gynecological Survey* (from Volume I, 1946), *Ophthalmic Literature* (from Volume I, 1947), *Quarterly Journal of Pharmacy and Pharmacology* (from Volume XX, 1947), *Rheumatism* (from Volume III, 1946), *Transactions of the Association of American Physicians* (from Volume LX, 1947), *Transactions of the Ophthalmological Society of New Zealand* (B.M.A.) (from 1947), *Transactions of the Urological Society of Australasia* (from Volume I, 1947), *Tubercle* (from Volume XXIX, 1948).

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING of the Medical Sciences Club of South Australia was held on November 7, 1947.

The Histopathology of Appendices Removed at Operation.

DR. ORDE POYNTON gave a preliminary report on an investigation he has begun on the histopathology of appendices removed at operation. During the first three months 176 specimens were examined, among which were 10 cases of acute hæmorrhagic or gangrenous appendicitis, 34 of acute appendicitis with total or partial destruction of the mucosa, 12 of obliterative chronic appendicitis, five of chronic appendicitis with mucocele, 15 of chronic appendicitis limited to fibrosis of the submucosa, and 72 of lymphoid hyperplasia; 28 were normal. There was no evidence to date of any relationship between acute appendicitis with neutrophile cell infiltration and lymphoid hyperplasia of the appendix. The latter might well be a condition within normal limits or at most represent some local response to toxic irritation or a state of sensitization. If this was correct, and it was also accepted that fibrosis of the submucosa was an insignificant lesion, then 61 out of 176 (35%) showed evidence of gross disease. It would be necessary to extend the investigation to several thousand cases to draw significant conclusions in regard to the relation of these appearances to the sex and age of the patients.

A MEETING of the Medical Sciences Club of South Australia was held on May 7, 1948.

The Pleuro-Pneumonia Group of Organisms and their Relationship to Arthritis.

MRS. K. W. DRAPER said that the pleuro-pneumonia group of organisms occupied a position between the viruses and the bacteria. They passed through bacterial filters, but would grow on special bacteriological media. The strain causing bovine pleuro-pneumonia had been most studied in the past, being fairly easy to grow in culture. The rat, mouse and human strains needed more complex media for their growth. The organisms were viewed with dark ground illumination as they did not stain with ordinary stains. Most diseases due to pleuro-pneumonia organisms affected the joints and it therefore seemed likely that the group might play some part in human arthritis. A mouse strain had been isolated in America which caused arthritis in 100% of mice when injected intravenously. Although the organisms had not so far been isolated from joints of humans, they could often be grown in culture from the female genital tract, especially when pelvic disease or arthritis was present. It also seemed that they might have some connexion with non-specific urethritis, and even more probable that they were the causative agents of Reiter's syndrome.

Neurosyphilis.

A symposium on some aspects of neurosyphilis occupied most of the evening.

Observations on the Treatment of Neurosyphilis with Rat-Bite Fever.

DR. ORDE POYNTON opened the symposium by sketching briefly the story of the introduction and subsequent course of syphilis in Europe. He pointed out that while *dementia paralytica* was one of the most syphilitic of syphilitic diseases, the association of dementia and syphilis was recognized very late and directly confirmed by Noguchi only in 1913. Dr. Poyton then discussed the elaboration of pyrexia treatment for neurosyphilis since von Jauregg's first suggestion in 1887. The efficacy of malarial and artificial pyrexias was mentioned and the speaker went on to describe his own work on inducing pyrexia by the use of the organism of rat-bite fever, *Spirillum minus*, in Malaya where the chronic endemicity of malaria precluded any prospect of success with malaria injections. Forty subjects of *dementia paralytica*, mostly in poor physical condition, were given intravenous injections of a virulent human strain of *Spirillum* maintained by guinea-pig passage. (Inoculation by scarification conduced to ulceration and was abandoned in favour of injection.) All were successfully infected and a high proportion showed satisfactory fever. Usually, after two relapses during which the patient had had about six days of fever reaching to 104° F. and three days reaching to 102° F., the fever was stopped with neoarsphenamine. Despite the initial poor condition of most of the patients and the advanced stage of infection, six showed remissions comparable with that from malaria treatment and another small group showed some improvement. The induced fever sometimes caused collapse, but no immediate fatalities. The most serious complication was nephritis and four patients died of uræmia. The clinical records were lost during the Japanese occupation.

Penicillin and other Therapeutic Agents in Neurosyphilis.

DR. IAN MARTIN first outlined some of the most important characters of neurosyphilis and emphasized the necessity for early diagnosis and prompt, energetic and sustained treatment. Then he recounted some exerimental results which illustrated the value of penicillin in the treatment of syphilis. He discussed the better clinical results obtained by combining penicillin and malaria as compared with either alone and gave a summary of the course he employed. That comprised intensive therapy with Lugol's iodine, bismuth, malaria, penicillin and tryparsamide for the first series, repeated after one month without malaria and thereafter as necessary. The best results were obtained in total courses lasting one hundred and twenty to two hundred days. Dr. Martin drew attention to the dangers associated with the treatment, particularly the optic nerve Herxheimer reaction, and mentioned the use of BAL for the latter condition.

Serology.

MR. R. A. W. SHEPPARD pointed out that serological tests for syphilis were not strictly specific and that with the increasing sensitivity of the test "false positive" responses were becoming commoner. Such "false positive" results

had been reported in leprosy, filariasis and malaria and a few other conditions; a small percentage of apparently normal individuals might also give a "false positive" response. That meant that if the test was to remain reliable a limit must be placed on its sensitivity. A positive serological response alone was sufficient for a diagnosis of syphilis; such a diagnosis was justifiable only in conjunction with full consideration of the whole medical finding and repeated serological examination.

The Royal College of Obstetricians and Gynaecologists.

Regional Council in Australia: Results of By-Election.

THE results of the by-election held in July, 1948, for the Regional Council of the Royal College of Obstetricians and Gynæcologists were as follows.

Fellow representing the Southern Area (Victoria, South Australia, Western Australia and Tasmania): Dr. Edward R. White, Melbourne.

Member representing the Northern Area (New South Wales and Queensland): Dr. T. H. Small, Sydney.

Examination for Membership (M.R.C.O.G.).

The Royal College of Obstetricians and Gynæcologists (London) has approved of the holding of an examination for the M.R.C.O.G. in Australia in 1950. The actual date has not yet been decided, but will probably be between March and May, 1950. Information with regard to conditions of eligibility to take this examination may be obtained from the Honorary Secretary of the Australian Regional Council, Professor B. T. Mayes, Obstetric Department, University of Sydney. The Honorary Secretary would appreciate an intimation from any prospective candidate of his intention to sit for the examination.

Correspondence.

MEDICAL FEES AND NATIONALIZATION OF MEDICINE.

SIR: Dr. Molesworth's most excellent and timely letter must surely echo the thoughts that most of us have on this matter of urgent reform. It is put so clearly and simply that I feel that it should be given a wide publicity, for it is the patient and the Press who must fully understand the need for a change in our scale of fees. In 1944 Dr. Donald Copping (THE MEDICAL JOURNAL OF AUSTRALIA, September 16, 1944) published a letter, "National Medical Service", wherein he worked out, using trade union principles, that the average practitioner's income should not be less than £2500 when nationalized. Should this letter have escaped the eyes of Dr. Molesworth and many others, my humble recommendation is that time will not be wasted in looking it up.

Yours, etc.,

GEOFFREY PERN.

Ballarat,
Victoria,
August 1, 1948.

PULMONARY TUBERCULOSIS IN SOUTH AUSTRALIA.

SIR: In your issue of July 24, 1948, an article appears under the title "Pulmonary Tuberculosis in South Australia". This essay, purporting as it does to draw valid conclusions from collected figures, can do nothing more than raise misconceptions.

On the author's statement the Central Board of Health regard their figures as "approximately 85% accurate". This falls far short of the accuracy needed for a proper scientific approach to the problem. The figures also do not give a true picture of the morbidity rate, since many cases diagnosed as pulmonary tuberculosis in the past have not been notified. It is further pointed out that a year of high notification rate coincides with a year of high death rate. One may be justified in concluding that in many cases the diagnosis is not made until the patient is almost ready to cross the Styx.

Conclusion one may be stated somewhat differently as follows: "When a patient's disease has progressed to the stage where it produces ill health and he is notified as suffering from pulmonary tuberculosis his chances of recovery are not good." This disregards entirely many cases of disease of minimal extent which are frequently treated but not notified. It is in this latter group and not in the first that we must look for the results of treatment. However, this knowledge cannot be obtained until a fact-finding survey has discovered the prognosis of untreated minimal pulmonary tuberculosis in South Australia.

The deduction that "in the broad view all the science and money involved in the battle to save sufferers from pulmonary tuberculosis over the last thirty-five years are achieving little or no success" is not warranted, nor can these figures be used to support the contention that "although the death rate has fallen and is falling the outlook for the individual patient is no better now than it was thirty years ago".

The author concludes with the pious wish that his "experimental effort" may "point a way to further statistical analysis of this and other diseases". I trust that in future any opinions expressed or conclusions drawn will be based on solid facts and not on figures which are "approximately 85% accurate".

Yours, etc.,

CYRIL SWAINE.

Repatriation General Hospital,
Springbank,
South Australia.
August 13, 1948.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following letter has been received from the secretary of the New South Wales Medical Board.

Dear Sir,

I am directed by the New South Wales Medical Board to inform you that reciprocity of medical registration in terms of the *Medical Practitioners Act*, 1938-1945, of New South Wales, has now been established in respect of graduates of medicine of the Ceylon Medical College and University of Ceylon who are registered with the Ceylon Medical Council, and graduates of medicine of the University of Sydney who are registered with the New South Wales Medical Board.

This means that subject to being an acceptable character in good standing with the New South Wales Medical Board and to establishment of identification, payment of registration fee, etc., a medical practitioner with qualifications obtained at the University of Sydney may now become registered to practise in Ceylon without any other conditions than those outlined above. This State will accept in return medical graduates of the Ceylon Medical College and University of Ceylon under similar conditions.

The address of the Ceylon Medical Council is Kynsey Road, Colombo 8, but it would be desirable for any person who might be interested in obtaining registration in Ceylon to communicate with this Board in the first instance.

Yours faithfully,

G. R. FLEMING,
Secretary.

August 9, 1948.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1939, of New South Wales, as duly qualified medical practitioners:

Bridgeman, Samuel, M.B., Ch.B., 1928 (Univ. Leeds), 28, Maritimo Street, Seaforth.

D'Arcy, Arthur Frederick Joseph, L.M.S.S.A., 1927 (London), 70, Lagoon Street, Narrabeen.

Gilmore, Hugh Robert, M.B., B.S., 1945 (Univ. Adelaide), District Hospital, Broken Hill.

Grant, Donald Kerr, M.B., B.S., 1942 (Univ. Adelaide), c.o. Imperial Service Club, Sydney.

Horn, Craig Angus, M.B., B.S., 1942 (Univ. Queensland), 53, Burns Bay Road, Lane Cove.

Macdonald, Jean, M.B., B.S., 1946 (Univ. Queensland), c.o. Dr. G. Fitzgerald, 16, Linthorpe Street, Newtown.

Maclurkin, Iver Douglas Macarthur Brodie, L.R.C.P., L.R.C.S. (Edinburgh), L.R.F.P.S. (Glasgow), 1938, c.o. Mr. Jackson, Watson Victor Limited, Bligh Street, Sydney.

Mickler, Morris, M.B., B.S., 1921 (Univ. Durham), c.o. Hotel Bondi, Bondi Beach.

Taylor, Rachel, M.B., Ch.M., 1923 (Q.U. Belfast), 22, Beaumont Street, Rose Bay.

The following additional qualifications have been registered:

Freeman, Zelman Samuel, 76, Birriga Road, Bellevue Hill (M.B., B.S., 1944, Univ. Sydney), M.R.A.C.P., 1948.

Hodgkinson, Henry Richard Taylor, 20, Ocean Avenue, Edgecliff (M.B., B.S., 1939, Univ. Sydney), M.S., 1948 (Univ. Sydney), F.R.A.C.S., 1948.

Webb, Pauline Hopwood, 23, Bushlands Avenue, Gordon (M.B., B.S., 1942, Univ. Sydney), D.C.H. (R.C.P. and S., England), 1947.

QUEENSLAND.

The undermentioned have been registered, pursuant to the provisions of *The Medical Acts, 1939 to 1946*, of Queensland, as duly qualified medical practitioners:

Hooper, Francis Maxwell, M.B., B.S., 1945 (Univ. Sydney), c.o. Hospitals Board, Rockhampton.

Clarke, Marcus Carlyle, M.B., B.S., 1937 (Univ. Sydney), D.T.M., 1946 (Univ. Sydney), c.o. British Medical Agency, Wickham Terrace, Brisbane.

Austin, John Charles, M.B., B.S., 1946 (Univ. Sydney), Repatriation General Hospital, Greenslopes, Brisbane.

TASMANIA.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Act*, 1918, of Tasmania, as duly qualified medical practitioners:

Manser, Robert William Edward, M.B., B.S., 1943 (Univ. Melbourne), Launceston.

Sinclair, Bruce, M.B., B.S., 1947 (Univ. Sydney), Launceston.

Budge, Alexander George Campbell, M.B., B.S., 1933 (Univ. Sydney), Launceston.

Obituary.

WILLIAM FRANCIS ORR.

WE regret to announce the death of Dr. William Francis Orr, which occurred on July 23, 1948, at Melbourne.

THOMAS ALEXANDER McLEAN.

WE regret to announce the death of Dr. Thomas Alexander McLean, which occurred on August 14, 1948, at Melbourne.

Medical Appointments.

Dr. A. T. Dunlop has been appointed a member and chairman of the Board of Optometrical Registration in pursuance of the provisions of the *Opticians Act*, 1930-1946, of New South Wales.

The undermentioned have been appointed to the honorary medical staff of the Royal Alexandra Hospital for Children, Camperdown: dermatologist, Dr. H. W. R. Sharp; assistant dermatologist, Dr. R. H. Kaines; assistant radiologist, Dr. A. Owen; relieving assistant surgeon, Dr. F. N. Street; assistant ophthalmic surgeon, Dr. R. L. Raymond; relieving assistant ophthalmic surgeon, Dr. I. B. Jack.

Diary for the Month.

SEPT. 1.—Victorian Branch, B.M.A.: Branch Meeting.
SEPT. 1.—Western Australian Branch, B.M.A.: Council Meeting.
SEPT. 2.—New South Wales Branch, B.M.A.: Special Groups Committee.
SEPT. 2.—South Australian Branch, B.M.A.: Council Meeting.
SEPT. 3.—Queensland Branch, B.M.A.: Branch Meeting. Jackson Lecture.
SEPT. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
SEPT. 9.—Victorian Branch, B.M.A.: Organization Subcommittee.
SEPT. 10.—Queensland Branch, B.M.A.: Council Meeting.
SEPT. 13.—Victorian Branch, B.M.A.: Finance, House and Library Subcommittee.
SEPT. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
SEPT. 15.—Western Australian Branch, B.M.A.: General Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch **(Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.**

Victorian Branch **(Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.**

Queensland Branch **(Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.**

South Australian Branch **(Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.**

Western Australian Branch **(Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.**

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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